PART B

SOLAR - GEOPHYSICAL DATA

ISSUED

OCTOBER 1964

U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
BOULDER, COLORADO

CRPL-F 242
PART B

NATIONAL BUREAU OF STANDARDS
CENTRAL RADIO PROPAGATION LABORATORY
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The descriptive text was republished November 1963.

Addenda to the text were published August and September 1964.

The Present Sunspot Minimum And Short-Term Predictions For The New Cycle

by R. G. Giovanelli, C.S.I.R.O., Sydney, Australia

A method of analyzing sunspot minima, based on the rate of appearance of new spot groups, has recently been described by R. G. Giovanelli (Observatory, 84, 57 (1964), who finds that time-plots for the decaying cycles are very reproducible from one minimum to another. The curves for the new cycles are almost as reproducible, the main difference between the various minima being the phase of onset of the new cycle.

Giovanelli and Miss McCabe believe that there is now just sufficient data on which to base a prediction for the new cycle. In Fig. 1 they have plotted the rates of appearance of new spot groups of both old and new cycles against solar rotation. The continuous curves are the mean decay and rise curves for previous minima this century, fitted to current observations. Old cycle points are indicated by dots, new by crosses. The broken lines are the theoretical quartile curves which, because of statistical fluctuations, should divide the observed points into four sets containing equal numbers.

The cross-over of the two curves, which is close to solar minimum, is believed to be about rotation No. 1483, which commenced on July 12, 1964. The height of the cross-over point is greater than at any previous minimum this century, suggesting that the sun will not be as quiet as during the previous minima. On their prediction, the new cycle is now dominant over the old.

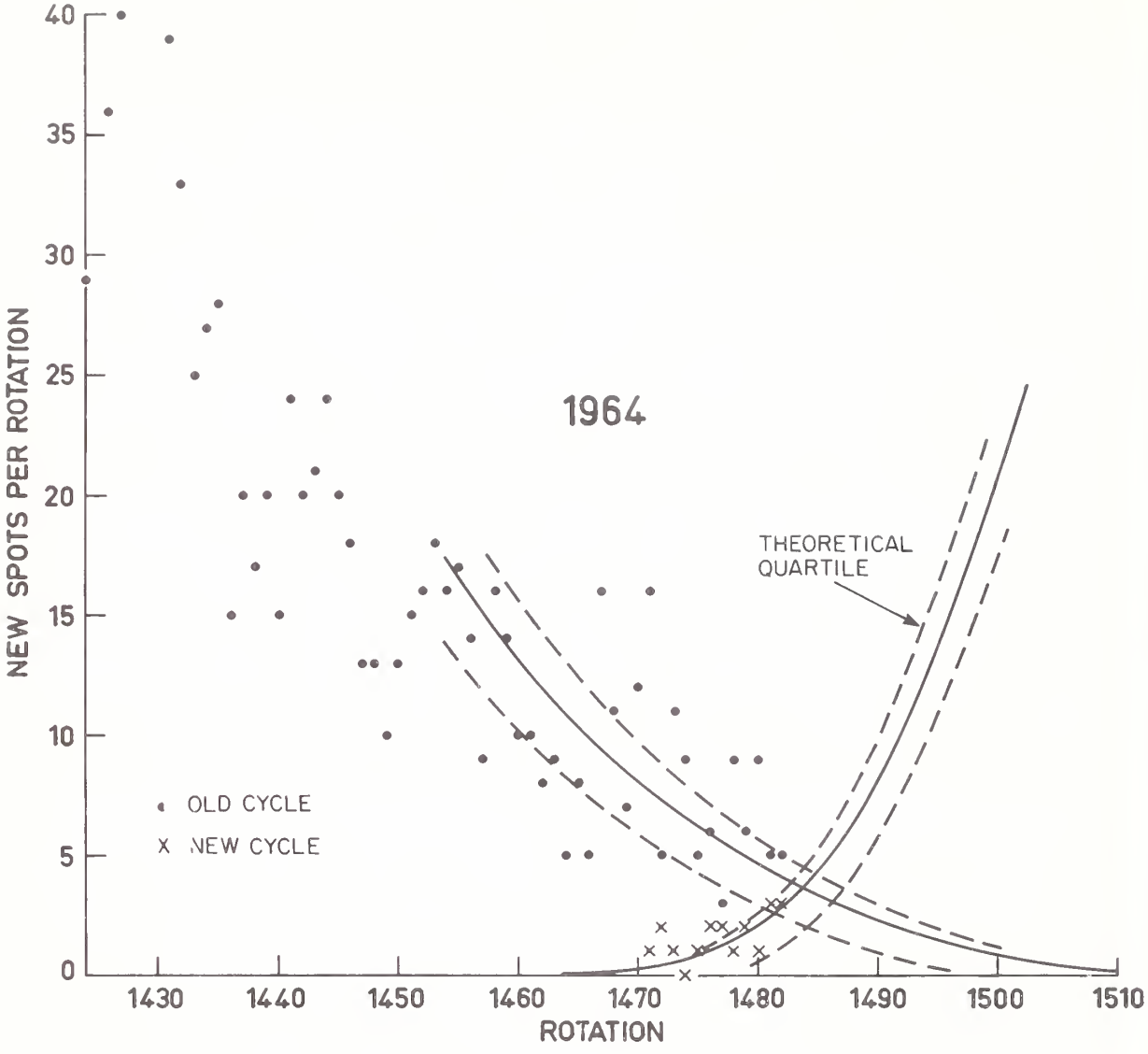
40
35
30
25
20
15
10
5
0
NEW SPOTS PER ROTATION
1964
THEORETICAL
QUARTILE
OLD CYCLE
NEW CYCLE
1430
1440
1450
1460
1470
1480
1490
1500
1510
ROTATION

Figure 1

DAILY SOLAR INDICES

Aug. 1964	American Relative Sunspot Numbers R_A'
1	10
2	18
3	8
4	4
5	3
6	1
7	2
8	0
9	0
10	4
11	6
12	15
13	23
14	36
15	38
16	27
17	13
18	11
19	11
20	7
21	3
22	1
23	0
24	0
25	0
26	0
27	0
28	0
29	0
30	0
31	1
Mean:	7.8

Sept. 1964	Zürich Provisional Relative Sunspot Numbers R_Z	Daily Values Solar Flux at 2800 Mc, Ottawa, Canada Flux S	Flux S_A
1	7	70.0	71.3
2	8	69.2	70.4
3	8	69.6	70.8
4	0	69.8	71.0
5	0	69.7	70.8
6	0	70.4	71.5
7	7	70.7	71.8
8	20	70.8	71.9
9	11	71.4	72.4
10	10	71.8	72.8
11	10	72.1	73.0
12	20	72.3	73.2
13	14	72.0	72.9
14	11	71.6	72.5
15	0	71.1	71.9
16	0	69.5	70.2
17	0	68.4	69.0
18	0	68.4	69.0
19	0	68.8	69.4
20	0	68.9	69.5
21	0	68.6	69.1
22	0	68.7	69.1
23	0	68.5	69.0
24	0	68.0	68.4
25	0	67.8	68.1
26	0	69.4	69.7
27	0	69.7	70.0
28	0	70.2	70.5
29	0	70.7	70.9
30	7	71.4	71.6
Mean:	4.4	70.0	70.7

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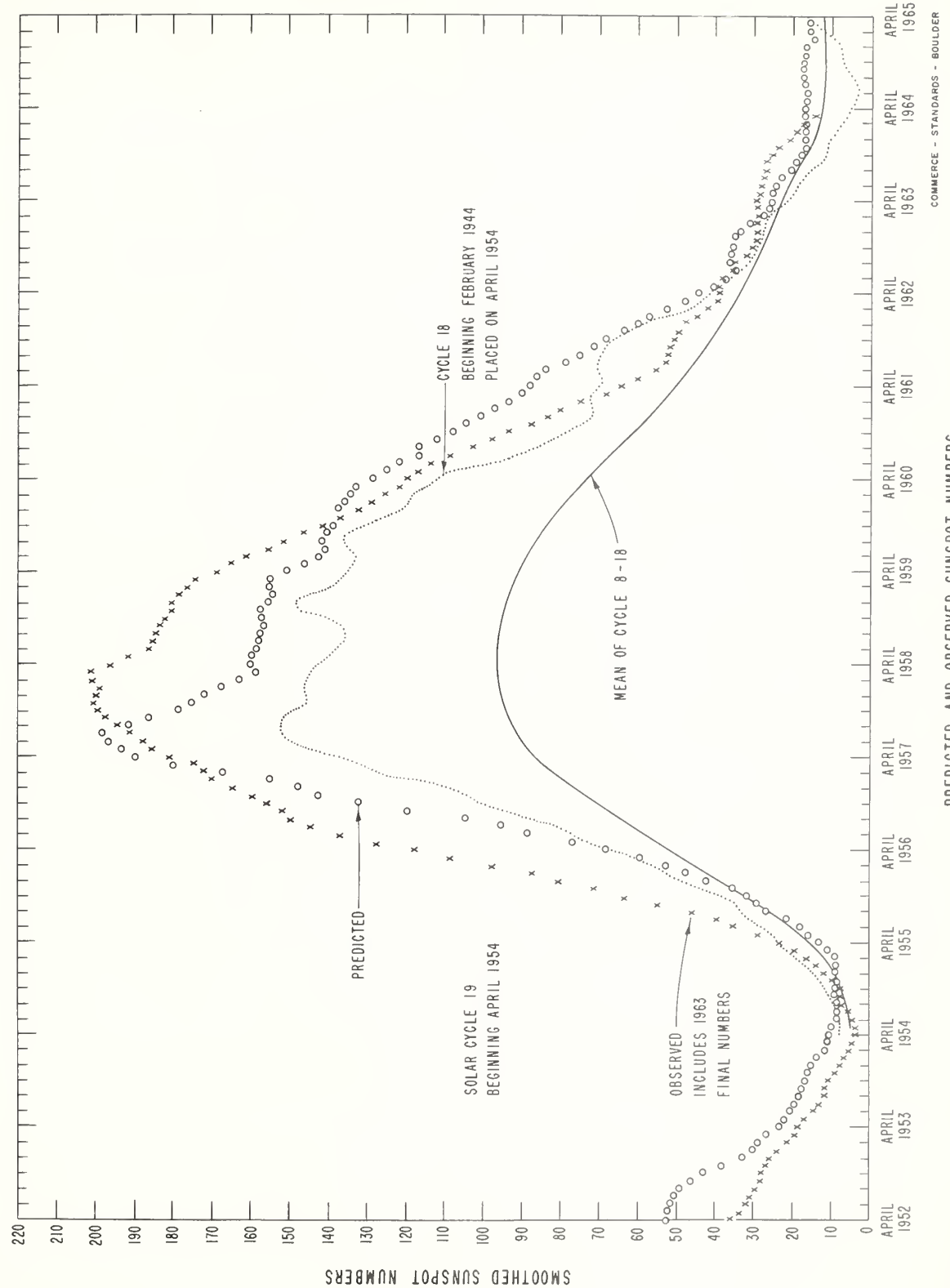
SMOOTHED SUNSPOT NUMBERS
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
APRIL 1952
APRIL 1953
APRIL 1954
APRIL 1955
APRIL 1956
APRIL 1957
APRIL 1958
APRIL 1959
APRIL 1960
APRIL 1961
APRIL 1962
APRIL 1963
APRIL 1964
APRIL 1965
PREDICTED
SOLAR CYCLE 19
BEGINNING APRIL 1954
OBSERVED
INCLUDES 1963
FINAL NUMBERS
MEAN OF CYCLE 8-18
CYCLE 18
BEGINNING FEBRUARY 1944
PLACED ON APRIL 1954
COMMERCE - STANDARDS - BOULDER
PREDICTED AND OBSERVED SUNSPOT NUMBERS

CALCIUM PLAGE AND SUNSPOT REGIONS

SEPTEMBER 1964

Sept. 1964	LAT.	McMATH PLAGE NUMBER	RETURN OF REGION	CALCIUM PLAGE DATA						SUNSPOT DATA		
				CMP VALUES		HISTORY	AGE (ROTATIONS)	DATE FIRST SEEN (1)	DURATION (DAYS) (1)	CMP VALUES		HISTORY
				AREA	INT.					AREA	COUNT	
2.5	S06	7473	New	(300)	(1.5)	b \ d	1	Sept. 5	2			
2.9	S14	7475 (2)	New	(100)	(2)	b — d	1	Sept. 6	1			
5.9	S35	7471	New	100	1.5	b — d	1	Sept. 4	2			
6.3	N38	7470	New	300	2.5	b / ℓ	1	Sept. 3	11	(121)	(2)	b \ d
6.8	N23	7468	7430	600	2.5	ℓ — ℓ	2	Aug. 30	14	(36)	(1)	ℓ \ d
8.3	N05	7479 (2)	New	(100)	(1.5)	b — d	1	Sept.10	1			
9.3	N33	7469	New	300	1.5	ℓ — d	1	Sept. 2	8			
9.6	N17	7472 (2)	New	(100)	(1.5)	b — d	1	Sept. 4	1			
10.0	N07	7480	New	(300)	(3)	b / ℓ	1	Sept.12	4			
10.1	S11	7477	New	200	2	b — d	1	Sept. 7	2			
12.1	N29	7474	7437	300	1.5	ℓ — d	3	Sept. 5	12			
12.4	N10	7476	7443	500	1.5	ℓ — d	2	Sept. 6	11			
14.1	S10	7481	New	100	1	b \ d	1	Sept.12	2			
14.4	N05	7478 (3)	New	500	2.5	ℓ \ d	1	Sept. 8	≥10			
14.9	N32	7482 (2)	New	100	1.5	b — d	1	Sept.15	1			
16.3	S17	7483 (2)	New	300	1.5	b — d	1	Sept.17	1			
19.6	S11	7484 (2)	New	100	1	b — d	1	Sept.20	1			
20.3	S23	7489 (2)	New	(100)	(2.5)	b — d	1	Sept.23	1			
20.7	N19	7486 (2)	New	100	1.5	b — d	1	Sept.22	1			
21.0	S02	7490	New	(100)	(1)	b / d	1	Sept.23	2			
22.3	N07	7487	New	200	1	b — d	1	Sept.22	2			
22.4	N22	7495 (2)	New	(100)	(1.5)	b — d	1	Sept.26	1			
24.4	N06	7485	New	400	1	b — ℓ	1	Sept.21	9			
25.4	S47	7496 (2)	New	100	1	b — d	1	Sept.26	1			
25.5	N00	7501 (2)	New	(200)	(2)	b — d	1	Sept.28	1			
26.2	S06	7491 (2)	New	(100)	(1)	b — d	1	Sept.23	1			
26.3	S10	7488 (2)	New	(300)	(1)	b — d	1	Sept.22	1			
26.5	N21	7504 (4)	New	(100)	(1.5)	b / ℓ	1	Sept.30	3			
26.7	N22	7498 (2)	New	200	2	b — d	1	Sept.27	1			
26.9	N02	7494	New	200	1.5	b — d	1	Sept.25	2			
27.8	N19	7492 (2)	New	(100)	(1)	b — d	1	Sept.23	1			
28.7	N26	7499	New	200	1	b — d	1	Sept.27	3			
28.9	S08	7502 (2)	New	200	1.5	b — d	1	Sept.29	1			
29.0	N08	7505	New	200	2	b — d	1	Sept.30	2			
29.1	N29	7493	New	(200)	(1)	b — d	1	Sept.24	2			
29.7	S08	7508 (5)	New	400	3	b / ℓ	1	Oct. 1	5			
30.3	N09	7497	New	(200)	(1)	b — d	1	Sept.26	1			

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(1) No calcium plage observations were secured at the McMath-Hulbert Observatory on Sept. 18-19, 1964.
(2) These very small and ephemeral plages last for only one day.
(3) Plage 7478 is in the same position as the short-lived plage 7446 of the preceding rotation.
(4) Plage 7504 is new, in the same position as ephemeral plage 7498.
(5) Plage 7508 is new, in the same position as ephemeral plage 7502.

SEPTEMBER 1964

SEPT. 1964	TIME MEAS. UT	LAT.	MER. DIST.	TYPE	SEPT. 1964	TIME MEAS. UT	LAT	MER. DIST	TYPE
1	1645	N22	E64	αp	9	1925	N38	W45	βγ
2	1915	N22	E52	αp	10	1725	N38	W52	αf
3	1615	N21	E40	αp	11	1825	N38	W69	βf
4	No Spots				12	1645	N37	W80	αp
							N07	W36	βp*
5	1715	N22	E16	αp					
					13	1845	N07	W50	βγ*
6	No Obs								
					14-15	No Obs			
7	1850	N39	W17	βp					
		N22	W12	αp	16-30	No Spots			
8	1530	N38	W30	βγ					

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* Old cycle designation.

PROVISIONAL CORONAL LINE EMISSION INDICES

SEPTEMBER 1964

CMP Sep 1964	North East Quadrant (observed 7 days earlier)				South East Quadrant (observed 7 days earlier)				South West Quadrant (observed 7 days later)				North West Quadrant (observed 7 days later)			
	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1	G_6	G_1	R_6	R_1
1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2	x	x	x	x	x	x	x	x	6	8	16	20	5	8	18	30
3	x	x	x	x	x	x	x	x	5	6	13	19	4	5	12	21
4	x	x	x	x	x	x	x	x	4	17	14a	28a	3	17	17a	26a
5	14	32	x	x	3	6	x	x	0	0	16	26	26	53	19	43
6	x	x	x	x	x	x	x	x	0	0	11	15	50	102	26	46
7	21a	48a	x	x	0a	0a	x	x	x	x	x	x	x	x	x	x
8	x	x	x	x	x	x	x	x	x	x	15	28	14	18	14	33
9	15a	28a	x	x	0a	0a	x	x	1	6	12	20	10	17	19	26
10	1a	6a	11a	15a	0a	0a	10a	12a	0	0	20	24	17	45	16	20
11	x	x	13	22	x	x	11	13	4	6	20	28	10	13	16	24
12	12	34	x	x	0	0	x	x	x	x	x	x	x	x	x	x
13	x	x	x	x	x	x	x	x	3	17	x	x	8	8	x	x
14	6	25	12	18	0	0	13	18	9	12	19	21	21	26	15	23
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
16	6	9	15	17	4	5	13	18	2a	6a	9	10	7a	11a	11	18
17	4	4	17	20	4	4	14	15	x	x	17	18	x	x	13	14
18	0	0	15a	24a	0	0	11a	18a	x	x	x	x	x	x	x	x
19	0	0	13	20	0	0	16	24	x	x	x	x	x	x	x	x
20	0	0	17	22	0	0	12	16	3	4	x	x	4	4	x	x
21	x	x	x	x	x	x	x	x	3	3	13	16	2	5	9	12
22	10	12	13	20	x	x	13	18	7	9	12	16	8	10	13	19
23	0	0	21	30	3	6	8	16	x	x	x	x	x	x	x	x
24	1	3	17	21	1	3	10	14	x	x	x	x	x	x	x	x
25	6	7	16	24	3	6	16	25	2a	11a	18	22	0a	0a	15	22
26	x	x	x	x	x	x	x	x	8a	43a	15	24	0a	0a	16	24
27	6	8	x	x	0	0	x	x	2	8	12	14	0	0	16	20
28	13	16	14	20	12	16	17	25	x	x	x	x	x	x	x	x
29	x	x	x	x	x	x	x	x	20	64	19	26	4	8	22	28
30	15a	20a	10	13	6a	8a	10	12	x	x	x	x	x	x	x	x

x = no observations * = yellow line emission a = index computed from low weight data

SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	01	0205	0220	NO FLARE	PATROL											
	01	0240	0305	NO FLARE	PATROL											
	01	0315	0320	NO FLARE	PATROL											
	01	0730	0800	NO FLARE	PATROL											
	01	1000	1040	NO FLARE	PATROL											
	01	1045	1220	NO FLARE	PATROL											
	01	1710	1715	NO FLARE	PATROL											
	01	2115	2250	NO FLARE	PATROL											
	02	0340	0415	NO FLARE	PATROL											
	02	0520	0525	NO FLARE	PATROL											
	02	0740	0755	NO FLARE	PATROL											
	02	0805	0850	NO FLARE	PATROL											
	02	0900	0955	NO FLARE	PATROL											
	02	1000	1030	NO FLARE	PATROL											
	02	1035	1045	NO FLARE	PATROL											
	02	1050	1135	NO FLARE	PATROL											
	02	1140	1200	NO FLARE	PATROL											
	02	1215	1220	NO FLARE	PATROL											
OTTAWA	02	1555 E	1734	1557	N33	E90			1-	P	1557	.17				
OTTAWA	02			1659	N33	E90										
	02	1945	2030	NO FLARE	PATROL											
LOCKHEED	02	2323 U	2335 U	2328 U	N20	E11			1-	2	2328	.20	.20		10	
LOCKHEED	02	2335 U	2345 U	2338 U	N10	E49			1-	2	2338	.20	.30		10	
SYDNEY	03	0435	0448	0439	N21	E44			1-	C	0439	.60	.84			
SYDNEY	03	0500	0507	0503	N21	E44			1-	C	0503	.40	.56			
SYDNEY	03	0501	0505	0503	N20	E45			1-	C	0503	.40	.56			
	03	0530	0535	NO FLARE	PATROL											
	03	0645	0710	NO FLARE	PATROL											
	03	0720	0815	NO FLARE	PATROL											
	03	1005	1020	NO FLARE	PATROL											
	03	1025	1030	NO FLARE	PATROL											
	03	1040	1100	NO FLARE	PATROL											
	03	1150	1200	NO FLARE	PATROL											
LOCKHEED	03	1846 U	1906 U	1851 U	S06	E10			1-	2	1851	.30	.30		10	
LOCKHEED	03	2015 U	2026 U	2018 U	S05	E09			1-	2	2018	.20	.20		10	
	04	0155	0230	NO FLARE	PATROL											
	04	0500	0505	NO FLARE	PATROL											
	04	0550	0625	NO FLARE	PATROL											
	04	0800	0810	NO FLARE	PATROL											
	04	1000	1040	NO FLARE	PATROL											
	04	1045	1125	NO FLARE	PATROL											
	04	1235	1310	NO FLARE	PATROL											
MCMATH	04	1643	1651 D	1644	N33	E61	7469		1-	C	1644	.20	.40			
	05	0205	0215	NO FLARE	PATROL											
	05	0335	0415	NO FLARE	PATROL											
	05	0420	0455	NO FLARE	PATROL											
	05	0545	0640	NO FLARE	PATROL											

SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	05	0810	0920	NO FLARE	PATROL											
	05	1000	1020	NO FLARE	PATROL											
	05	1030	1140	NO FLARE	PATROL											
	05	1220	1225	NO FLARE	PATROL											
	05	1245	1250	NO FLARE	PATROL											
LOCKHEED	05	2125	2200	2140	S14	W40			1-	2	2140	.20	.30		10	
	06	0355	0405	NO FLARE	PATROL											
	06	0420	0545	NO FLARE	PATROL											
	06	0635	0645	NO FLARE	PATROL											
	06	0745	0810	NO FLARE	PATROL											
	06	0915	1115	NO FLARE	PATROL											
	06	1140	1145	NO FLARE	PATROL											
	06	1200	1255	NO FLARE	PATROL											
SAC PEAK	07	0047 E	0056 O	0050	N20	W09			1-	C		.21	.21		18	
LOCKHEED	07	0048	0059	0053	N20	W10			1-	2	0053	.30	.30		20	
	07	0120	0430	NO FLARE	PATROL											
	07	0510	0525	NO FLARE	PATROL											
	07	0600	0605	NO FLARE	PATROL											
	07	0615	0640	NO FLARE	PATROL											
	07	0750	0825	NO FLARE	PATROL											
	07	0835	0900	NO FLARE	PATROL											
ARCETRI	07	0900 E	0910 O		N38	W14			1-	3	0900	.52	.62			
	07	0910	0940	NO FLARE	PATROL											
	07	1000	1020	NO FLARE	PATROL											
	07	1025	1115	NO FLARE	PATROL											
	07	1135	1255	NO FLARE	PATROL											
LOCKHEED	07	2055	2119	2104	N21	E39			1-	2	2104	.20	.30		10	
MCMATH	07	2057	2110	2100	N32	E41	7474		1-	C	2100	.20	.30			
SAC PEAK	07	2058 E	2115 O	2102	N32	E40			1-	C		.29	.33		17	
	08	0400	0405	NO FLARE	PATROL											
	08	0425	0435	NO FLARE	PATROL											
	08	0455	0635	NO FLARE	PATROL											
CAPRI-S	08	0710 E	0725		N38	W24	7470	15 O	1	3	0722	1.50	2.00			
	08	0750	0830	NO FLARE	PATROL											
CAPRI-S	08	0851 E	0905		N38	W26			1-	3	0855	.50	.60			
	08	1000	1205	NO FLARE	PATROL											
LOCKHEED	08	2000	2040	2020	N28	W68			1-	2	2020	.20	.40		10	
LOCKHEED	08	2250	2330	2257	S15	E15			1-	2	2257	.30	.30		10	
IKOMASAN	09	0020	0035		N38	W34			1-	V	0020	1.20	1.70			
	09	0310	0325	NO FLARE	PATROL											
	09	0410	0415	NO FLARE	PATROL											
	09	0430	0450	NO FLARE	PATROL											
	09	0500	0525	NO FLARE	PATROL											
	09	0605	0825	NO FLARE	PATROL											
CAPRI-S	09	0805 E	0817		N37	W32			1-	3	0812	.30	.40			
ARCETRI	09	0825 E	0838 O		N37	W38			1-	3	0838	.46	.66			
CAPRI-S	09	0830	0846		N37	W35			1-	3	0836	.30	.40			

SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	09	1000	1100	NO FLARE	PATROL											
	09	1110	1225	NO FLARE	PATROL											
	09	1230	1305	NO FLARE	PATROL											
LOCKHEED	09	1925	1952	1935	S21	W60			1-	2	1935	.20	.30		10	
	10	0500	0515	NO FLARE	PATROL											
	10	0540	0550	NO FLARE	PATROL											
	10	0555	0610	NO FLARE	PATROL											
	10	0615	0645	NO FLARE	PATROL											
	10	0650	0810	NO FLARE	PATROL											
	10	0835	0845	NO FLARE	PATROL											
	10	1010	1025	NO FLARE	PATROL											
	10	1030	1140	NO FLARE	PATROL											
	10	1200	1210	NO FLARE	PATROL											
	10	1220	1230	NO FLARE	PATROL											
LOCKHEED	10	1805	1817	1810	S12	E40			1-	2	1810	.20	.30		10	
	11	0145	0635	NO FLARE	PATROL											
	11	0845	0855	NO FLARE	PATROL											
	11	0905	1015	NO FLARE	PATROL											
	11	1020	1135	NO FLARE	PATROL											
	11	1225	1250	NO FLARE	PATROL											
HUANCAYO	11	1650 E	1920 D		N37	W73			1-	S	1650	.40	1.30			
SYDNEY	11	2209	2221	2213	N38	W72	7470	12	1	C	2213	1.00	4.00			
	12	0445	0455	NO FLARE	PATROL											
SYDNEY	12	0521	0535	0524	N06	W28			1-	C	0524	.80	.92			
SYDNEY	12	0624	0633	0627	N07	W28			1-	C	0627	1.20	1.32			
	12	0750	0800	NO FLARE	PATROL											
	12	0835	0855	NO FLARE	PATROL											
	12	0915	0955	NO FLARE	PATROL											
	12	1005	1120	NO FLARE	PATROL											
MCMATH	12	1710	1729	1715	N37	W85	7470		1-	C	1715	.30				
LOCKHEED	12	1712	1735	1718	N37	W84			1-	2	1718	.20	.60		10	
OTTAWA	12	1715 E	1722		N38	W82			1-	C	1716	.47	1.30			
LOCKHEED	12	1928	1946	1935	N37	W84			1-	2	1935	.40	1.00		10	
MCMATH	12	1929	1939	1932	N37	W87	7470		1-	C	1932	.30				
MCMATH	12	2015	2026	2018	N06	W39	7480		1-	C	2018	.30	.40			
MCMATH	12	2100	2111	2102	N37	W88	7470		1-	C	2102	.30				
LOCKHEED	12	2100	2115	2104	N37	W84			1-	2	2104	.20	.60		10	
	13	0120	0200	NO FLARE	PATROL											
	13	0250	0435	NO FLARE	PATROL											
	13	0510	0535	NO FLARE	PATROL											
CAPRI-S	13	0702	0724		N38	W85			1-	2	0712	.80				
	13	0750	0805	NO FLARE	PATROL											
	13	0810	0840	NO FLARE	PATROL											
	13	0925	0935	NO FLARE	PATROL											
ARCETRI	13	0952 E	1000 D		N37	W88	7470	8 D	1	1	0952	.49	2.40			
	13	1000	1045	NO FLARE	PATROL											
	13	1055	1120	NO FLARE	PATROL											

SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ho	MAX INT. %	PROVISIONAL IONOSPHERIC EFFECT
	13	1240	1245	NO FLARE	PATROL											
LOCKHEED	13	1638	1730	1650	N38	W90			1-	2	1650	.10	.50		10	
LOCKHEED	13	1905	1930	1915	N38	W90			1-	2	1915	.10	.50		10	
	14	0435	0440	NO FLARE	PATROL											
CAPRI-S	14	0708 E	0725 D		S04	E33			1-	3	0710	1.00	1.30			
	14	0800	0845	NO FLARE	PATROL											
	14	1010	1100	NO FLARE	PATROL											
	14	1110	1120	NO FLARE	PATROL											
LOCKHEED	14	2055	2110	2100	S09	W68			1-	2	2100	.10	.30		10	
	15	0100	0115	NO FLARE	PATROL											
	15	0745	0830	NO FLARE	PATROL											
	15	1000	1055	NO FLARE	PATROL											
	15	1105	1120	NO FLARE	PATROL											
	16	0345	0400	NO FLARE	PATROL											
	16	0805	0850	NO FLARE	PATROL											
	16	0855	0900	NO FLARE	PATROL											
	16	0905	0945	NO FLARE	PATROL											
	16	1005	1045	NO FLARE	PATROL											
	16	1050	1105	NO FLARE	PATROL											
	16	1110	1125	NO FLARE	PATROL											
	16	1730	1805	NO FLARE	PATROL											
LOCKHEED	16	2100	2120	2106	N35	W55			1-	2	2106	.10	.20		10	
	17	0120	0230	NO FLARE	PATROL											
	17	0645	0805	NO FLARE	PATROL											
	17	0810	0900	NO FLARE	PATROL											
	17	0935	1005	NO FLARE	PATROL											
	17	1010	1025	NO FLARE	PATROL											
	17	1045	1055	NO FLARE	PATROL											
	17	1105	1150	NO FLARE	PATROL											
	17	1200	1215	NO FLARE	PATROL											
	18	0100	0235	NO FLARE	PATROL											
	18	0315	0330	NO FLARE	PATROL											
SYDNEY	18	0631	0656	0637	N07	E50			1-	C	0637	.30	.45			
	18	0805	0825	NO FLARE	PATROL											
	18	0830	0840	NO FLARE	PATROL											
	18	0855	0915	NO FLARE	PATROL											
	18	0925	0950	NO FLARE	PATROL											
	18	0955	1030	NO FLARE	PATROL											
	18	1105	1120	NO FLARE	PATROL											
	18	1125	1215	NO FLARE	PATROL											
	18	1240	1300	NO FLARE	PATROL											
	18	1855	1905	NO FLARE	PATROL											
	19	0155	0215	NO FLARE	PATROL											
	19	0245	0315	NO FLARE	PATROL											
	19	0345	0400	NO FLARE	PATROL											

SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Ha	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	19	0605	0610	NO FLARE	PATROL											
	19	0655	0805	NO FLARE	PATROL											
	19	0925	0930	NO FLARE	PATROL											
	19	1000	1125	NO FLARE	PATROL											
LOCKHEED	19	2039	2052	2043	N26	E06			1-	2	2043	.20	.20		10	
LOCKHEED	19	2218	2248	2222	N09	E28			1-	2	2218	.60	.60		20	
SAC PEAK	19	2220 E	2245 D	2222	N08	E28			1-	C		.55	.57		17	
SYDNEY	19	2220	2252 D	2223	N08	E28	7487	32 D	1	P	2223	1.80	2.07			
	20	0415	0645	NO FLARE	PATROL											
	20	0745	0805	NO FLARE	PATROL											
	20	1005	1330	NO FLARE	PATROL											
	20	1335	1340	NO FLARE	PATROL											
	20	1355	1400	NO FLARE	PATROL											
LOCKHEED	20	1545 E	1604	1548	N01	W62			1-	2	1548	.20	.30		10	
LOCKHEED	21	0017	0030	0022	N02	W56			1-	2	0022	.30	.50		10	
	21	0105	0140	NO FLARE	PATROL											
	21	0155	0455	NO FLARE	PATROL											
	21	0505	0625	NO FLARE	PATROL											
	21	0730	0935	NO FLARE	PATROL											
	21	0945	0955	NO FLARE	PATROL											
	21	1000	1035	NO FLARE	PATROL											
	21	1040	1240	NO FLARE	PATROL											
MCMATH	21	2056	2112	2101	N05	E35	7485		1-	C	2101	.10	.10			
SYDNEY	21	2231	2235	2232	N02	E34			1-	C	2232	.40	.48			
	22	0130	0140	NO FLARE	PATROL											
	22	0235	0255	NO FLARE	PATROL											
	22	0330	0630	NO FLARE	PATROL											
	22	0730	0820	NO FLARE	PATROL											
	22	1000	1100	NO FLARE	PATROL											
	22	1105	1235	NO FLARE	PATROL											
	22	1240	1520	NO FLARE	PATROL											
	22	1525	1550	NO FLARE	PATROL											
	23	0110	0225	NO FLARE	PATROL											
	23	0555	0600	NO FLARE	PATROL											
	23	0700	0810	NO FLARE	PATROL											
	23	0835	0840	NO FLARE	PATROL											
	23	1000	1050	NO FLARE	PATROL											
	23	1055	1115	NO FLARE	PATROL											
	23	1120	1140	NO FLARE	PATROL											
	23	1145	1240	NO FLARE	PATROL											
	24	0005	0020	NO FLARE	PATROL											
	24	0030	0235	NO FLARE	PATROL											
	24	0535	0540	NO FLARE	PATROL											
CAPRI-S	24	0626 E	0705 D		N42	W90			1-	3	0645	1.00				
	24	0700	0815	NO FLARE	PATROL											
	24	1000	1055	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

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SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	24	1105	1300	NO FLARE	PATROL											
	24	1305	1405	NO FLARE	PATROL											
	24	1440	1615	NO FLARE	PATROL											
	24	1630	1730	NO FLARE	PATROL											
	24	1745	1810	NO FLARE	PATROL											
	24	1820	1950	NO FLARE	PATROL											
	24	2005	2035	NO FLARE	PATROL											
	24	2050	2100	NO FLARE	PATROL											
	24	2250	2400	NO FLARE	PATROL											
	25	0000	0400	NO FLARE	PATROL											
	25	0500	0610	NO FLARE	PATROL											
	25	0620	0630	NO FLARE	PATROL											
	25	0730	0815	NO FLARE	PATROL											
	25	0950	1005	NO FLARE	PATROL											
	25	1020	1050	NO FLARE	PATROL											
	25	1055	1150	NO FLARE	PATROL											
	25	1155	1255	NO FLARE	PATROL											
	25	1305	1350	NO FLARE	PATROL											
	25	1355	1430	NO FLARE	PATROL											
	25	1435	1455	NO FLARE	PATROL											
	25	1500	1505	NO FLARE	PATROL											
	25	1510	1515	NO FLARE	PATROL											
	25	1600	1610	NO FLARE	PATROL											
	25	1620	1645	NO FLARE	PATROL											
	25	1750	1805	NO FLARE	PATROL											
	25	2040	2050	NO FLARE	PATROL											
	25	2125	2350	NO FLARE	PATROL											
	25	2355	2400	NO FLARE	PATROL											
	26	0040	0200	NO FLARE	PATROL											
	26	0235	0325	NO FLARE	PATROL											
	26	0355	0405	NO FLARE	PATROL											
	26	0510	0530	NO FLARE	PATROL											
	26	0655	0715	NO FLARE	PATROL											
	26	0725	0800	NO FLARE	PATROL											
	26	1000	1005	NO FLARE	PATROL											
	26	1015	1110	NO FLARE	PATROL											
	26	1120	1210	NO FLARE	PATROL											
	26	1225	1310	NO FLARE	PATROL											
	26	1415	1420	NO FLARE	PATROL											
	26	1435	1525	NO FLARE	PATROL											
	26	1530	1710	NO FLARE	PATROL											
	26	1800	1840	NO FLARE	PATROL											
	26	1845	2005	NO FLARE	PATROL											
	26	2015	2145	NO FLARE	PATROL											
	27	0050	0535	NO FLARE	PATROL											
	27	0550	0650	NO FLARE	PATROL											
	27	0655	0745	NO FLARE	PATROL											
	27	0755	0825	NO FLARE	PATROL											

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SOLAR FLARES

SEPTEMBER 1964

OBSERVATORY	DATE SEPT 1964	OBSERVED UNIVERSAL TIME START	END	MAX PHASE	LOCATION APPROX. LAT.	MER. DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH Ha	MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	27	0900	0915	NO FLARE	PATROL											
	27	0940	1130	NO FLARE	PATROL											
	27	1230	1330	NO FLARE	PATROL											
	27	1605	1635	NO FLARE	PATROL											
	28	0050	0210	NO FLARE	PATROL											
	28	0255	0700	NO FLARE	PATROL											
	28	0825	0845	NO FLARE	PATROL											
	28	0910	1010	NO FLARE	PATROL											
	28	1020	1030	NO FLARE	PATROL											
	28	1035	1100	NO FLARE	PATROL											
	29	0610	0635	NO FLARE	PATROL											
	29	0735	0805	NO FLARE	PATROL											
	29	0815	0840	NO FLARE	PATROL											
	29	0845	0850	NO FLARE	PATROL											
	29	0930	0940	NO FLARE	PATROL											
	29	1000	1010	NO FLARE	PATROL											
	29	1020	1055	NO FLARE	PATROL											
	29	1105	1115	NO FLARE	PATROL											
	30	0145	0155	NO FLARE	PATROL											
	30	0535	0540	NO FLARE	PATROL											
	30	0720	0800	NO FLARE	PATROL											
	30	1000	1055	NO FLARE	PATROL											
	30	1110	1130	NO FLARE	PATROL											
	30	1135	1225	NO FLARE	PATROL											
LOCKHEED	30	1855	1922	1908	S07	W38			1-	2	1908	.20	.20		10	
LOCKHEED	30	2032	2044	2039	S07	W38			1-	2	2039	.20	.20		10	
LOCKHEED	30	2115	2135	2122	S23	F42			1-	2	2122	.20	.30		10	
	30	2345	2400	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

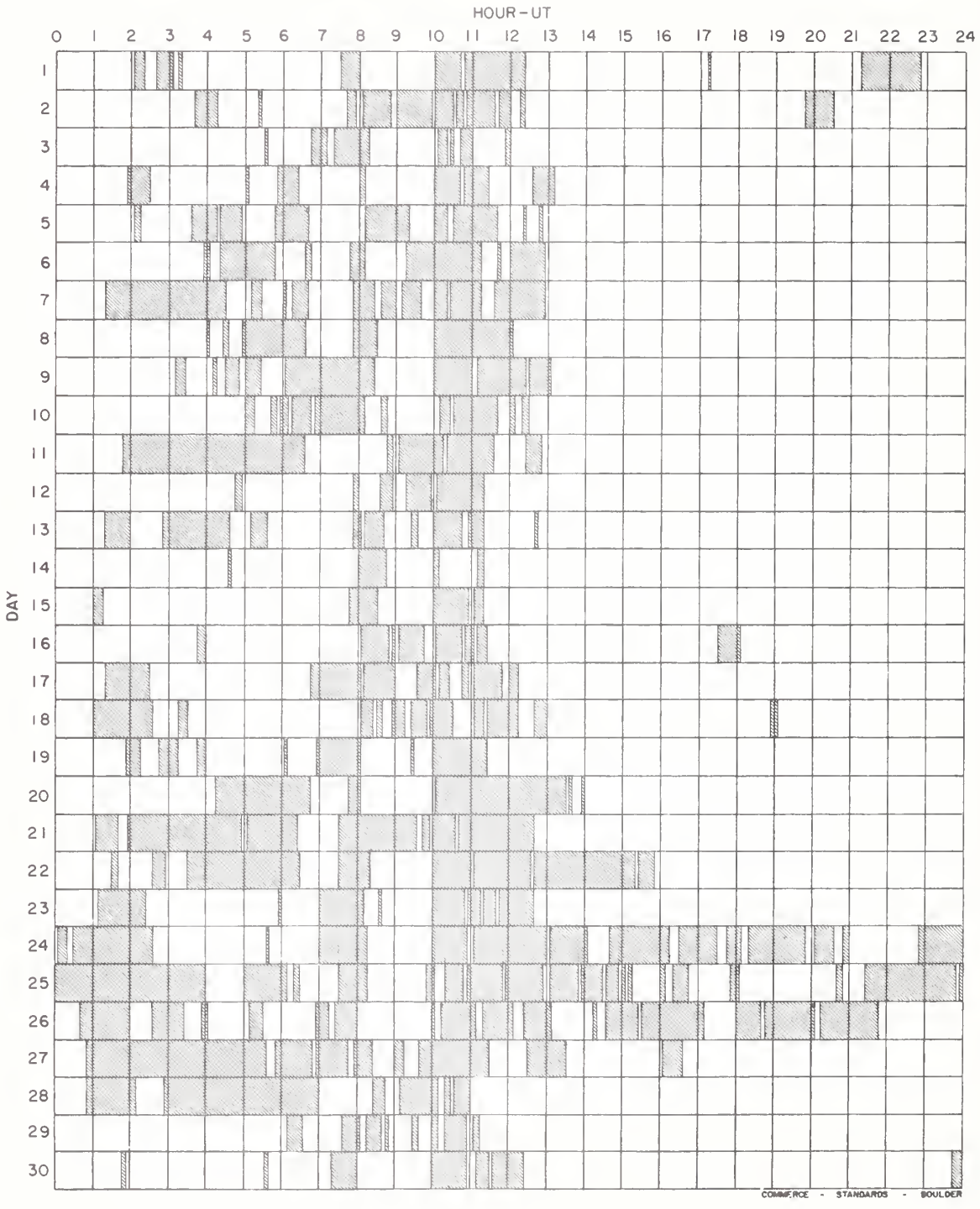
ATHENES	ATHENS, GREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN	NIZMIR	KRASNAYA PAKHRA, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE	KIEV KO	KIEV GAO, USSR	SAC PEAK	SACRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (GERMAN)	KIEV KY	KIEV UNIVERSITY, USSR	SALTSJÖBADEN	STOCKHOLM, SWEDEN
CAPRI S	CAPRI, ITALY (SWEDISH)	LOCKHEED	LOS ANGELES, CALIF., USA	SCHAUINS	SCHAUINSLAND, GFR
CRIMÉE	SIMEIZ, USSR	MCMATH	MCMATH-HULBERT PONTIAC, MICH., USA	TACHKENT	TASHKENT, USSR
HERSTMONCEU	ROYAL GREENWICH OBSERVATORY, HERSTMONCEUX, ENGLAND	MOSCOU	MOSCOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTE-PROVEN	HAUTE-PROVENCE	NEW SCHAUIN	FREIGURG, GFR		

ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAC PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERCENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORRECTED AREA VALUES LISTED FOR CLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □= NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS
PROVISIONAL
SEPTEMBER 1964



Observatories Included:

Arcetri	Huancayo	McMath-Hulbert	Ondrejov	Sydney
Dunsink	Istanbul	Mitaka	Ottawa	
Herstmonceux	Lockheed	Manila	Sacramento Peak	

SOLAR FLARES

JUNE 1964

OBSERVATORY	DATE JUNE 1964	OBSERVED UNIVERSAL TIME START	OBSERVED UNIVERSAL TIME END	OBSERVED UNIVERSAL TIME MAX. PHASE	LOCATION APPROX. LAT.	LOCATION APPROX. MER. DIST	LOCATION McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEASUREMENTS MEAS. AREA Sq. Deg.	MEASUREMENTS CORR. AREA Sq. Deg.	MEASUREMENTS MAX. WIDTH Hα	MEASUREMENTS MAX. INT. %	PROVISIONAL IONOSPHERIC EFFECT
	02	0145	0155	NO FLARE	PATROL											
SYDNEY	02	0319	0322	0320	N07	W09			1-	C	0320	.40	.40			
UCCLE	02	1427	1439		N06	W14			1-	4						
CAPRI F	03	1051 E	1056 D		N06	W23			1-	3	1051	.25	.26			
UCCLE	03	1558	1603	1600	N09	W25			1-	3						
CAPRI F	03	1558 E	1607 D		N06	W25			1-	2	1558	.25	.26			
SYDNEY	04	0529 E	0549	0542	S07	E34			1-	P	0542	.20	.20			
SYDNEY	04	0532	0549 D	0542	N10	W26			1-	P	0542	.40	.50			
	06	0200	0245	NO FLARE	PATROL											
UCCLE	06	0943 E	0945	0943	N09	W50			1-	3						
UCCLE	08	0955	0957		N34	E43			1-	4						
UCCLE	08	1355	1400	1357	N33	E41			1-	2						
UCCLE	09	0915	0919		S01	E15			1-	4						
UCCLE	09	0950	1001	0958	N25	E75	7348	11	1	4	0958	1.00	3.50			
UCCLE	09	1023	1026		N25	E75			1-	4						
UCCLE	09	1037	1111		N25	E75			1-	4						
UCCLE	09	1714	1727		N29	E77			1-	3						
UCCLE	10	0853	0857	0855	N25	E61			1-	4						
UCCLE	10	0905	0911	0909	N25	E61			1-	4						
UCCLE	10	0946	0950	0948	N06	E53			1-	4						
UCCLE	10	0959	1003		N25	E60			1-	3						
UCCLE	10	1033	1051		N29	W52			1-	4						
UCCLE	10	1055	1101		N05	E52			1-	4						
UCCLE	10	1106	1126		N05	E52			1-	4						
UCCLE	10	1144	1155		N33	W66			1-	4						
UCCLE	10	1158	1202 D	1202 U	N33	W66	7349	4 D	1	4	1202	1.00	3.50			
CAPRI F	10	1200 E	1212 D		N33	W65			1-	3	1200	.50	1.16			
CAPETOWN	10	1204	1233	1212	N25	E59			1-	C	1212	.80	1.60			
UCCLE	10	1341	1344		N24	E58			1-	3						
UCCLE	10	1431 E	1451		N29	W55			1-	2						
UCCLE	10	1431 E	1453		N24	E57			1-	2						
	11	0245	0250	NO FLARE	PATROL											
HALEAKALA	11	0411	0421	0415	N15	E49			1-	C	1415	.20	.30			
UCCLE	11	1456	1500		N03	E38			1-	2						
CAPRI F	11	1712 E	1727 D		N23	E38			1-	2	1712	.30	.42			
	12	0215	0230	NO FLARE	PATROL											
UCCLE	12	1432	1436		N03	E23			1-	2						
UCCLE	13	0823 E			N03	E13				3						
UCCLE	13	0908	0909		N26	E24			1-	3						
HALEAKALA	14	0036	0050	0041	N29	E66			1-	C	0041	.20	.40			
HALEAKALA	14	0314	0335	0329	N27	E66			1-	C	0329	.30	.50			

SOLAR FLARES

JUNE 1964

OBSERVATORY	DATE JUNE 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST.	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME — U T	MEAS. AREA Sq Deg	CORR AREA Sq. Deg.	MAX WIDTH He	MAX INT *.	PROVISIONAL IONOSPHERIC EFFECT
TACHKENT	14	0316 E	0338 D	0322	N28	E63			1-	C	0330	.50	1.20	3.10	85	
TACHKENT	14			0332	N28	E63										
TACHKENT	14	0408 E	0415 D	0410	N28	E63			1-							
TACHKENT	14	0419 E	0428 D	0421	N28	E63			1-							
CAPRI F	14	0825 E	0842 D		N04	E01			1-	3	0825	.25	.25			
CLIMAX	14	2353	0006	2357	N26	E54			1-	3	2357	.30	.40			
KANZELHOHE	15	0645 E	0800 D		N27	E49	7361	75 D	1					1.30		
KIEV KO	15	1146	1340	1152	N27	E45	7361	114	1	C	1326	3.00	4.62		72	
KIEV KO	15			1326	N27	E45										
CLIMAX	15	1316	1341	1327	N26	W57			1-	4	1327	1.20	1.60			
CLIMAX	15	1450	1508	1455	N25	E55			1-	4	1455	.20	.20			
CAPRI F	15	1457 E	1527		N24	E42	7361	30 D	1	3	1467	1.50	2.25			
UCCLE	15	1601	1606		N21	E46			1-	2						
CLIMAX	15	1809	1831 D	1817	N25	E52			1-	4	1817	1.00	1.20			
	15	1955	2015	NO FLARE	PATROL											
	15	2115	2125	NO FLARE	PATROL											
CLIMAX	15	2135	2146 D	2139	N25	E50			1-	3	2139	.50	.60			
	15	2145	2150	NO FLARE	PATROL											
	15	2210	2215	NO FLARE	PATROL											
SYDNEY	16	0237	0250	0245	N27	E41			1-	C	0245	.80	1.00			
SYDNEY	16	0500 E	0511 D	0508	N27	E36			1-	P	0508	1.40	1.80			
UCCLE	16	0858	0906		N25	E35			1-	3						
UCCLE	16	0959	1003 D		N25	E35			1-	3						
HALEAKALA	16	2145	2212	2155	N25	E26			1-	C	2155	.20	.20			
	17	0520	0530	NO FLARE	PATROL											
UCCLE	17	1140	1146		N24	E19			1-	3						
UCCLE	17	1451	1453		N24	E20			1-	3						
CAPETOWN	20	0824	0839	0827	N04	W76			1-	C	0827	.50				
UCCLE	20	1108	1114		N14	W75			1-	3						
CLIMAX	21	2334	2343 D	2341	N26	W38	7361	9 D	1	4	2341	2.10	2.50			
	22	0245	0300	NO FLARE	PATROL											
	22	0420	0445	NO FLARE	PATROL											
VOROSHILOV	22	2358 E	0013		N27	W40	7371	15 D	1	C	2359	1.44	2.07		78	
	23	0400	0415	NO FLARE	PATROL											
	23	0455	0505	NO FLARE	PATROL											
SYDNEY	25	0157	0208	0202	N26	W66			1-	C	0202	.20	.50			
UCCLE	25	0936	0940		N29	W70			1-	3						
	29	0105	0115	NO FLARE	PATROL											
	29	0405	0420	NO FLARE	PATROL											
	29	0515	0525	NO FLARE	PATROL											
UCCLE	29	1736	1740		S06	E67			1-	3						
	30	0215	0345	NO FLARE	PATROL											

COMMERCE - STANDARDS - BOULDER

SOLAR FLARES

JUNE 1964

OBSERVATORY	DATE JUNE 1964	OBSERVED UNIVERSAL TIME START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER DIST	McMATH PLAGE REGION	DURATION — MINUTES	IMPORTANCE	OBS. COND.	MEASUREMENTS TIME U T	MEAS. AREA Sq. Deg.	CORR. AREA Sq. Deg.	MAX WIDTH He	MAX INT *.	PROVISIONAL IONOSPHERIC EFFECT
	30	0405	0435	NO FLARE	PATROL											
	30	0440	0505	NO FLARE	PATROL											
UCCLE	30	1104	1107		S03	E57			1-	2						

COMMERCE - STANDARDS - BOULDER

These flares are addenda to the June 1964 flares published in GRPL-F Part B - 239 for July 1964.

ATHENES	ATHENS, GREECE	HONOLULU	HAWAII, USA	NERA	NEDERHORST den BERGH, NETHERLANDS
BAKOU	PIRCULI, USSR	IKOMASAN	KYOTO, JAPAN	NIZMIR	KRASNAYA PAKHRA, USSR
CAPETOWN	ROYAL OBSERVATORY, CAPE OF GOOD HOPE	KIEV KO	KIEV GAO, USSR	SAG PEAK	SAGRAMENTO PEAK, N.MEX. USA
CAPRI F	CAPRI, ITALY (GERMAN)	KIEV KY	KIEV UNIVERSITY, USSR	SALTSJÖBADEN	STOCKHOLM, SWEDEN
CAPRI S	CAPRI, ITALY (SWEDISH)	LOCKHEED	LOS ANGELES, CALIF., USA	SGHAUINS	SGHAUINSLAND, GFR
GRIMÉE	SIMEIZ, USSR	MCMATH	MCMATH-HULBERT PONTIAC, MIGH., USA	TACHKENT	TASHKENT, USSR
HERSTMONCEU	ROYAL GREENWIGH OBSERVATORY, HERSTMONGEUX, ENGLAND	MOSGOU	MOSCOW-GAISH, USSR	WENDEL	WENDELSTEIN, GFR
HTE-PROVEN	HAUTE-PROVENCE		NEW SGHAUIN FREIBURG, GFR		

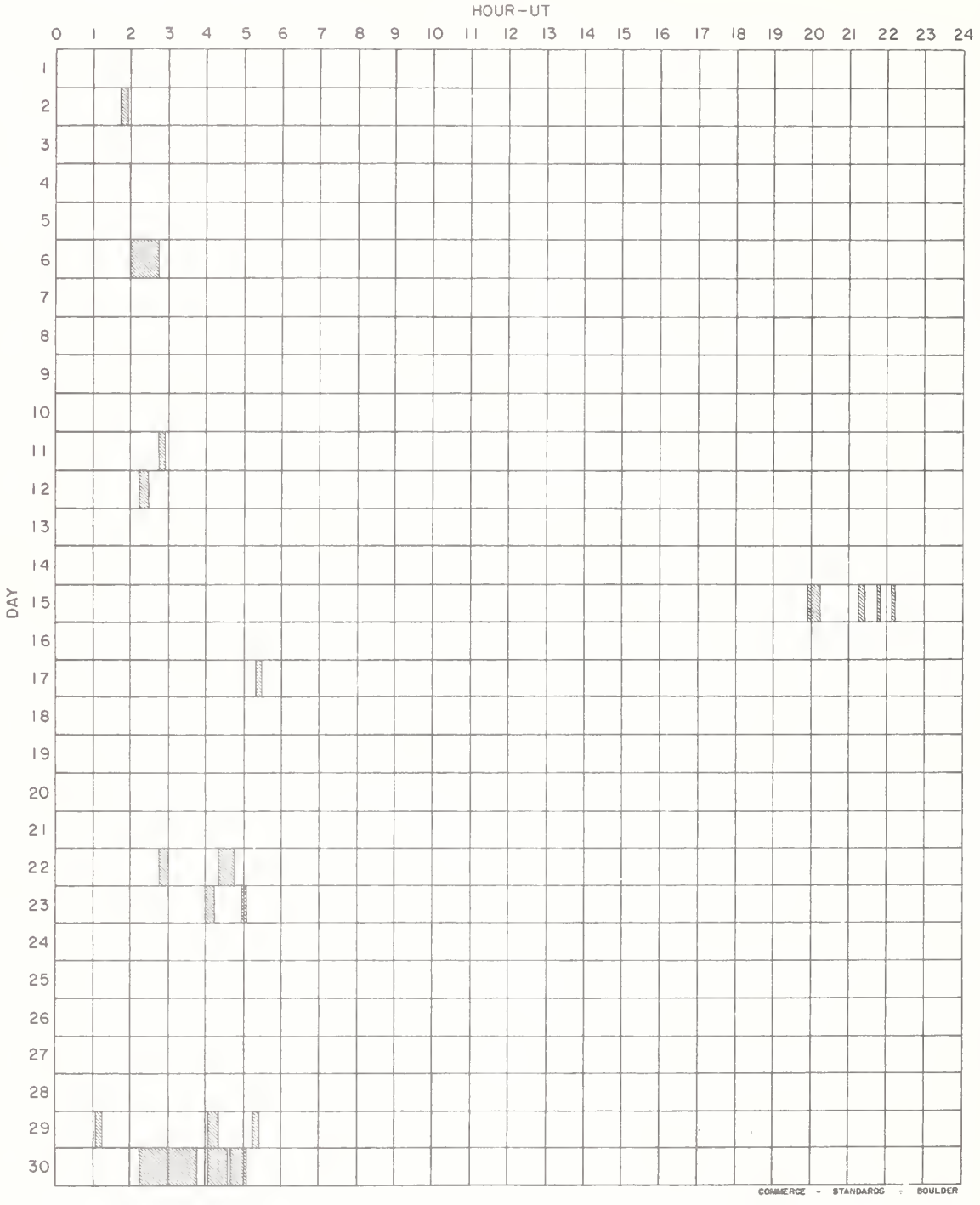
ALL VALUES IN THE MAXIMUM INTENSITY COLUMN FOR SAG PEAK ARE ARBITRARY UNITS (0-40) AND FOR LOCKHEED ARE ARBITRARY UNITS (10-40), NOT PERGENT OF CONTINUOUS SPECTRUM.

SEE DESCRIPTIVE TEXT PUBLISHED NOVEMBER 1961 FOR DEFINITION OF CORREGTED AREA VALUES LISTED FOR GLIMAX, HAWAII, LOCKHEED AND SACRAMENTO PEAK.

E = LESS THAN D = GREATER THAN U = APPROXIMATE □ = NOT REPORTED.

INTERVALS OF NO FLARE PATROL OBSERVATIONS

JUNE 1964



Observatories Included:

Abastumani	Catania	Huancayo	Locarno	Ondrejov	Wendelstein
Arcetri	Climax	Ikomasan	Lockheed	Ottawa	Wroclaw
Athenes	Crimee	Irkutsk	Lvov	Sacramento Peak	Zurich
Bucharest	Dunsink	Istanbul	Manila	Sydney	
Capetown	Haleakala	Kanzelhohe	McMath-Hulbert	Tachkent	
Capri-F (German)	Haute-Provence	Kiev-KO	Mitaka	Uccle	
Capri-S (Swedish)	Herstmonceux	Kodaikanal	Nizmir	Voroshilov	

IONOSPHERIC EFFECTS OF SOLAR FLARES

SHORT WAVE RADIO FADEOUTS — SUDDEN PHASE ANOMALIES
SUDDEN COSMIC NOISE ABSORPTION — SUDDEN ENHANCEMENTS OF SIGNAL
SUDDEN ENHANCEMENTS OF ATMOSPHERICS — SUDDEN FREQUENCY DEVIATIONS
SOLAR NOISE BURSTS AT 18 Mc/s

AUGUST 1964

AUG. 1964	UNIVERSAL TIME			TYPE SWF	IMPORTANCE						BUR	WIDE SPREAD INDEX	STATIONS	KNOWN FLARE
	START	END	MAX	IMP	ABS	SCNA	SEA	SPA	SES	SFD				
2	2105	2107									1	5	BO HA	

Footnote:

Errata: In CRPL-F 232B, December 1963, in Table IIIm, the October 1963 events given on October 14 beginning at 1853, 1932, 2052 and 2321 UT and on October 17 at 1342 UT are SFD not SES.

RIOMETER EVENTS

(Provisional)

AUGUST 1964

South Pole — **26 Mc/s**

AUG 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS	AUG 1964	START UT	END UT	MAX. UT	MAX. ABSORP. db, (tenths)	NO. OF PEAKS
1	0009	0357	0214	42	1	18	1254	1425	1312	5	1
1	1153	1758	1437	8	4	19	0858	1407	1147	11	1
2	0021	0356	0211	5	1	19	1949	2039	1951	3	2
2	0757	0822	0801	6	1	20	*				
3	*					21	1153	2146	1443	6	3
4	0217	0622	0307	21	2	22	0150	0650	0209	16	1
4	1140	1752	1530	9	5	22	1112	**	1757	4	6
4	2258	0028	2337	7	2	23	*				
5	1011	2356	1329	40	6	24	*				
6	0222	0405	0315	25	1	25	1550	2023	1757	3	3
6	2328	1700	0216	48	1	26	0056	0239	0147	11	1
7	2145	2256	2148	3	1	26	2205	0121	2214	22	1
8	0151	0258	0221	7	2	27	0920	1720	1343	9	3
8	0544	0643	0555	9	2	28	*				
9	*					29	0037	0147	0042	45	1
10	*					29	1347	1747	1647	4	2
11	2240	0255	2250	69	2	29	2126	2230	2204	7	1
12	**	2021	1029	8	1	30	0039	0242	0136	8	2
13	0014	0214	0152	13	3	31	0150	0335	0154	14	1
13	1312	1604	1342	5	1	31	1056	1834	1344	10	2
13	2129	0246	2246	51	2						
14	1002	0206	0112	9	1						
16	0157	0219	0200	4	1						
17	0125	0458	0403	12	1						
18	0301	0346	0314	7	3						

COMMERCE - STANDARDS - BOULDER

* No event.
** Uncertain.

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

SEPTEMBER 1964

ARO - OTTAWA **2800 Mc/s**

SEPT. 1964	URANE	DESCRIPTIVE TYPE	START UT	DURATION HRS. MIN.	MEAN FLUX	MAXIMUM TIME	MAXIMUM FLUX	REMARKS
None observed.								

COMMERCE - STANDARDS - BOULDER

HOURS OF OBSERVATION, JULY, AUGUST, SEPTEMBER, 1964

OBSERVING PERIOD:

July	11:00 - 01:55 UT
August	11:10 - 01:50 UT
September	11:40 - 01:30 UT

With the following exceptions:

(1) Observations commenced:
July 22 at 12:10 UT
Aug. 1 at 13:20 UT
3 at 12:25 UT
5 at 12:10 UT
22 at 13:00 UT
24 at 12:30 UT
27 at 12:10 UT
28 at 12:20 UT
29 at 12:10 UT
Sep. 4 at 13:50 UT
5 at 12:10 UT
11 at 12:15 UT

(2) Observations ended:
July 3 at 00:30 UT
Aug. 18 at 22:50 UT
Sep. 6 at 22:50 UT
8 at 00:20 UT
27 at 22:20 UT

(3) Interruption of observations, approximately 20 minutes in duration, for calibration purposes:
In the period 14:00 - 15:00 UT
July 21 & 22
Aug. 25 to 31 inclusive
Sep. 1 to 30 inclusive

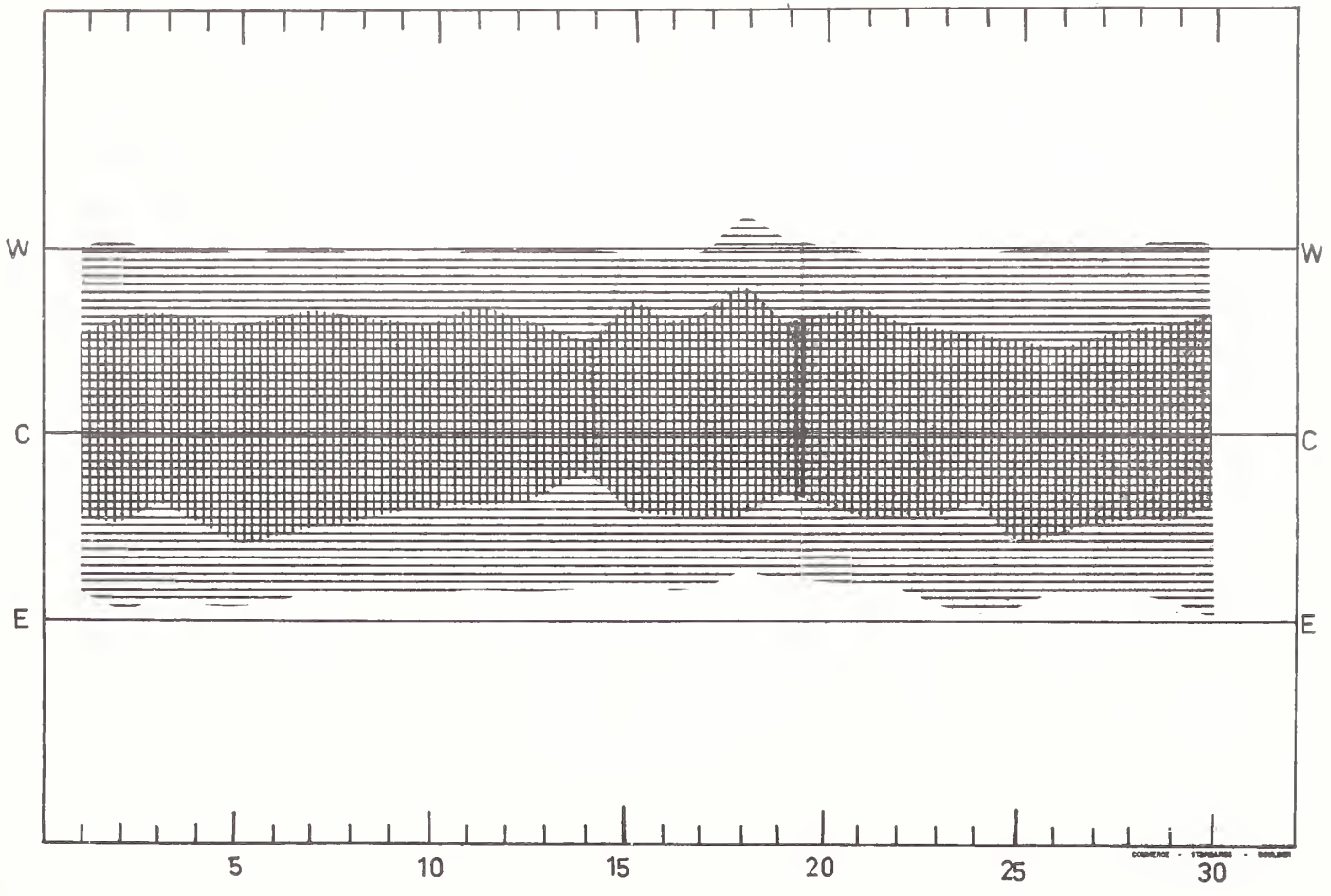
(4) Interference or set trouble obscuring records on:
July 31 13:35 to 15:15 UT
Aug. 26 12:50 to 14:00 UT
Sep. 14 12:20 to 14:45 UT

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATIONS

SEPTEMBER 1964

NANÇAY

169 Mc/s



SEPTEMBER 1964

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

SEPTEMBER 1964

NBS BOULDER 108 Mc/s

None observed.

NOMINAL TIMES OF OBSERVATION

SEPTEMBER 1964

NBS BOULDER 108 Mc/s

Sept. 1964	HOURS OF OBSERVATION U.T.	HOURS OF INTERFERENCE U.T.	Sept. 1964	HOURS OF OBSERVATION U.T.	HOURS OF INTERFERENCE U.T.
1	1232-0116		16	1247-1605;	
2	1233-1615;			2004-2250	
	2227-0114		17	1605-0051	
3	1234-2300;	1234-1510	18	1640-2121;	
	2308-0112			2219-0049	
4	1235-1614;	1235-1415	19	1249-0048	
	1957-0110		20	1250-0046	
5	1236-1709;	1236-1315			
	1904-2130		21	1251-0044	0015-0044
			22	1252-0043	1926-2003
6	No record		23	1253-0041	1832-1845
7	1634-0106	2351-2355;	24	1254-0039	
		2400-0007	25	1255-0038	
8	1239-0105	1417-1428			
9	1600-0104		26	1256-0036	1753-1757;
10	1241-0103				1821-1823;
					2034-2038
11	1614-0101		27	1345-0034	1857-1955
12	1245-0059		28	1258-0033	
13	1244-0058		29	1259-2002;	1729-2002
14	1245-0056			2227-0031	
15	1246-1549;		30	1300-0030	
	1620-0054				

COMMERCE - STANDARDS - BOULDER

Equipment operating erratically Sept. 1-19.

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

SEPTEMBER 1964

High Altitude Observatory
Boulder

7.6-41 Mc/s

Date Sep 1964	Bursts			
	Type	Time (U.T.)	Intensity	Frequency Range (Mc/s)
11 Sep	No Observ.	1646-2226		
15	No Observ.	1535-1724, 2018-2224		
16	No Observ.	2215-2400		
17	No Observ.	0000-0130		
19	III	2217:15-2217:45	1-	27-41
	III	2218:30-2219	1-	24-41
	III	2220:30-2220:45	1	25-41
25	No Observ.	0000-0130		
26	No Observ.	1745-2000		
27	No Observ.	1800-1855		
28	No Observ.	1805-2042, 2146-2230		
29	No Observ.	0027-0130		

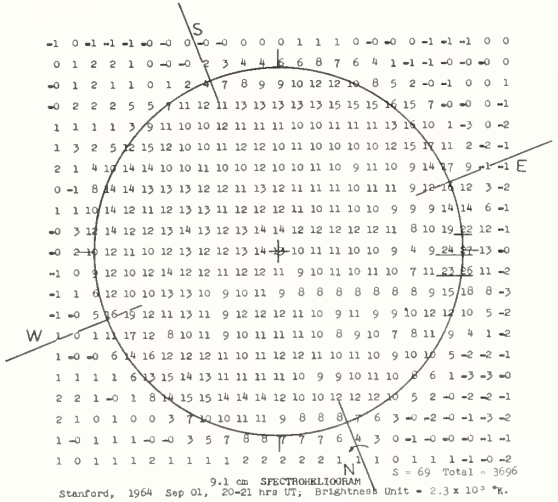
COMMERCE - STANDARDS - BOULDER

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

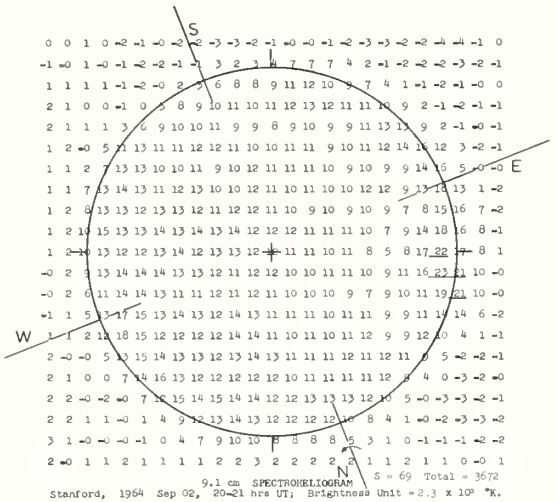
SEPTEMBER 1964

STANFORD

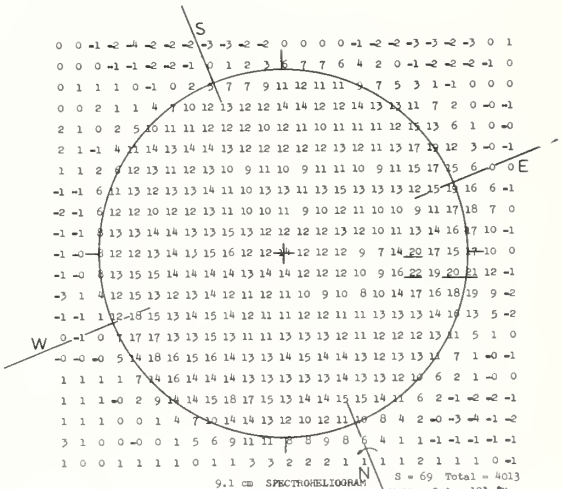
9.1 cm



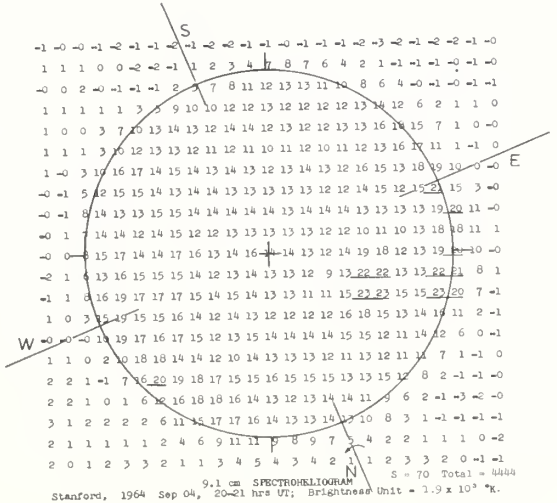
9.1 cm SPECTROHELIOGRAM
S = 69 Total = 3696
Stanford, 1964 Sep 01, 20-21 hrs UT; Brightness Unit = 2.3 x 10^3 °K.



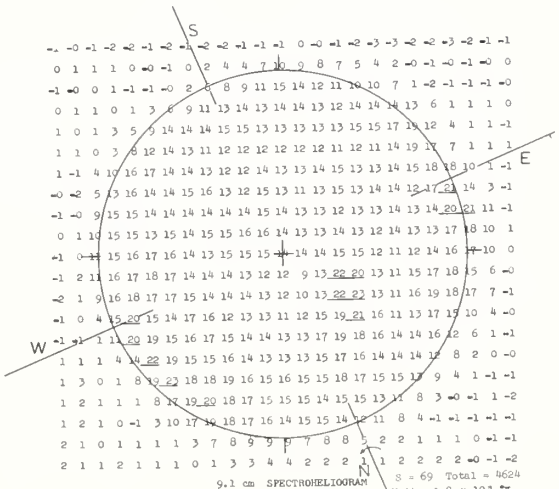
9.1 cm SPECTROHELIOGRAM
S = 69 Total = 3672
Stanford, 1964 Sep 02, 20-21 hrs UT; Brightness Unit = 2.3 x 10^3 °K.



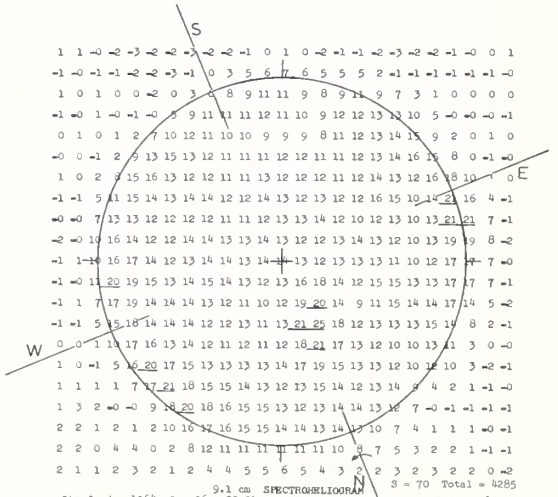
9.1 cm SPECTROHELIOGRAM
S = 69 Total = 4013
Stanford, 1964 Sep 03, 20-21 hrs UT; Brightness Unit = 2.1 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM
S = 70 Total = 4444
Stanford, 1964 Sep 04, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM
S = 69 Total = 4624
Stanford, 1964 Sep 05, 20-21 hrs UT; Brightness Unit = 1.8 x 10^3 °K.



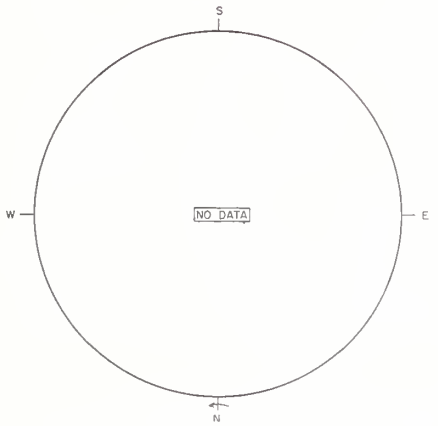
9.1 cm SPECTROHELIOGRAM
S = 70 Total = 4285
Stanford, 1964 Sep 06, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

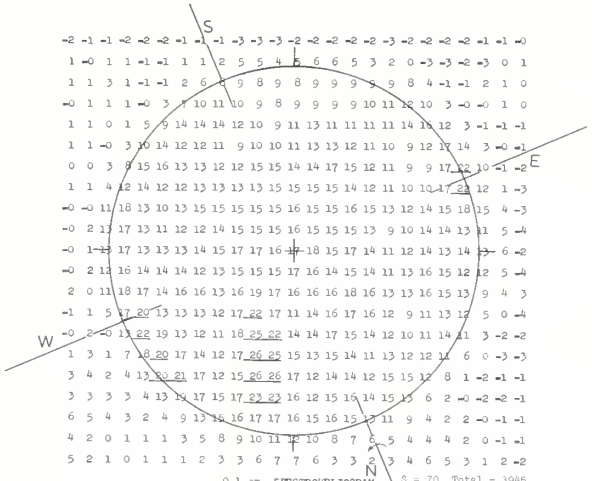
SEPTEMBER 1964

STANFORD

9.1 cm

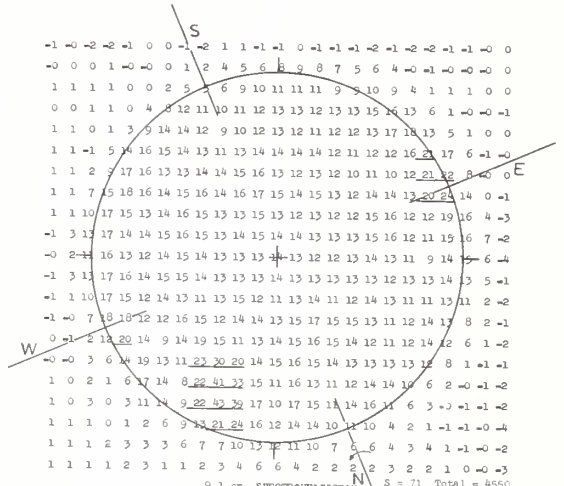


1964 SEPTEMBER 07



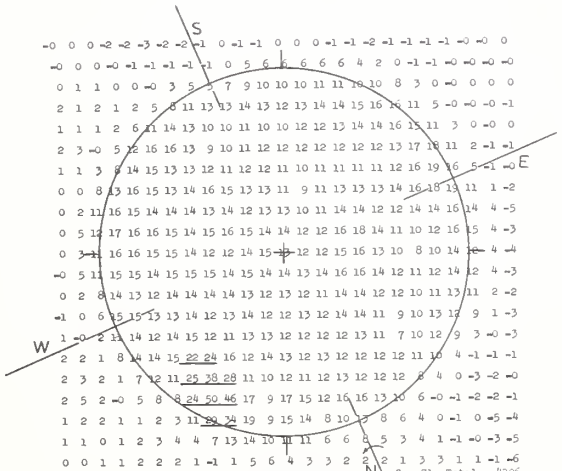
9.1 cm SPECTROHELIOGRAM S = 70 Total = 3945

Stanford, 1964 Sep 08, 20-21 hrs UT; Brightness Unit = 2.2 x 10^3 °K.



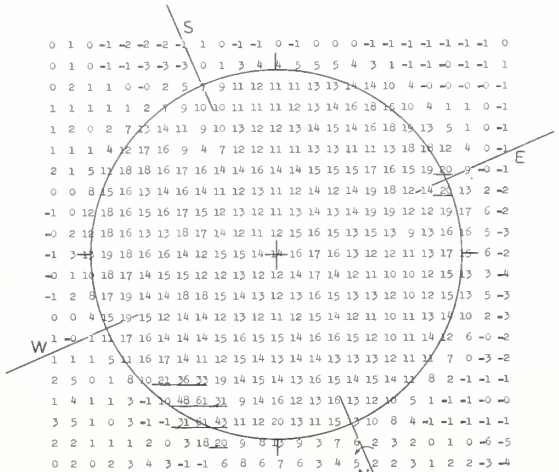
9.1 cm SPECTROHELIOGRAM S = 71 Total = 4550

Stanford, 1964 Sep 09, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



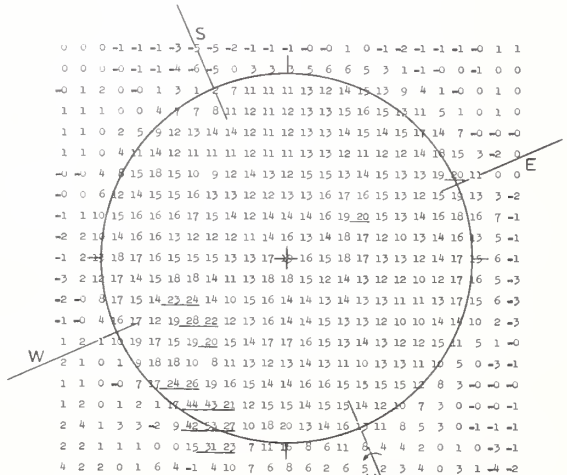
9.1 cm SPECTROHELIOGRAM S = 71 Total = 4306

Stanford, 1964 Sep 10, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 72 Total = 4647

Stanford, 1964 Sep 11, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 72 Total = 4713

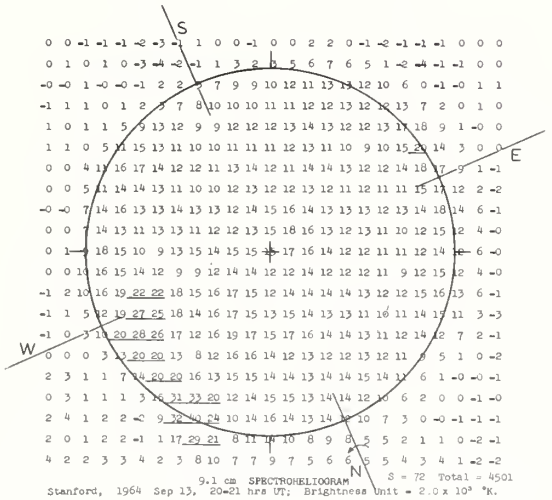
Stanford, 1964 Sep 12, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

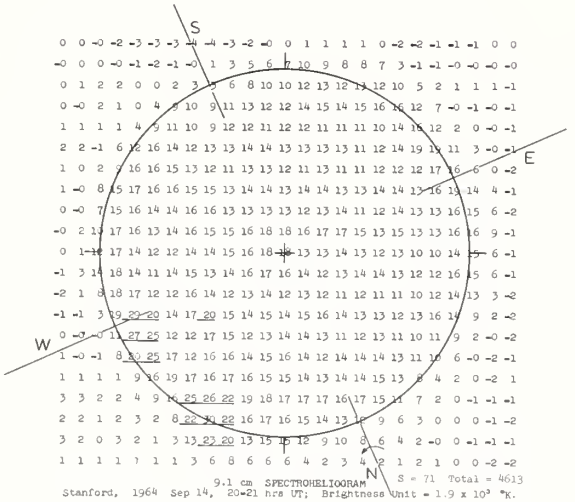
SEPTEMBER 1964

STANFORD

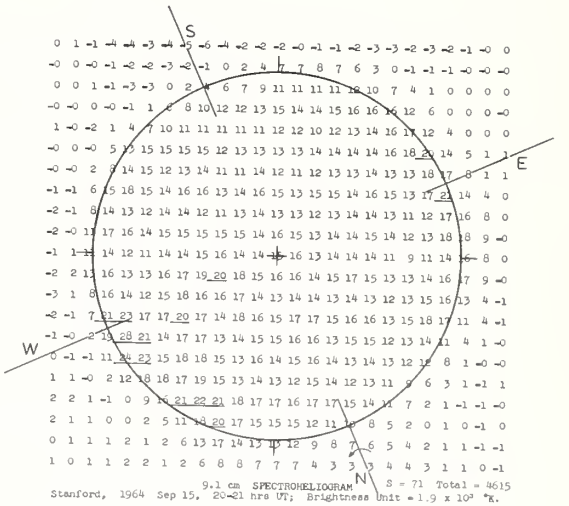
9.1 cm



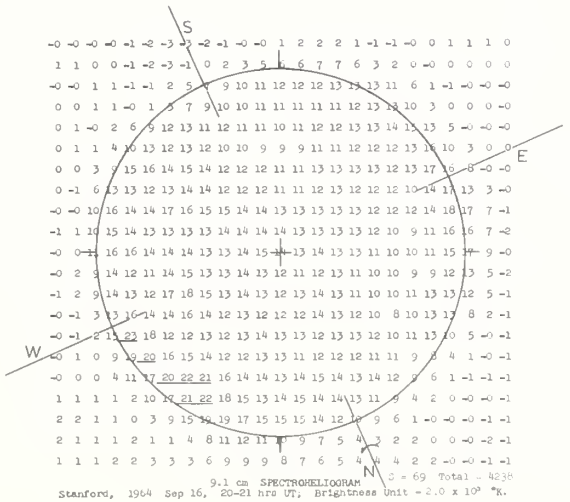
9.1 cm SPECTROHELIOGRAM S = 72 Total = 4501
Stanford, 1964 Sep 13, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.



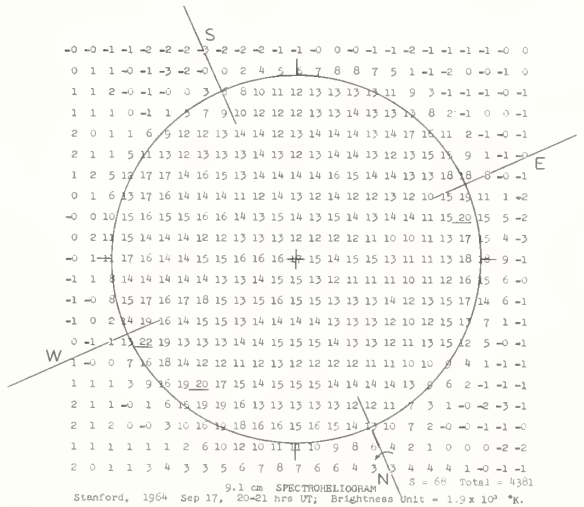
9.1 cm SPECTROHELIOGRAM S = 71 Total = 4613
Stanford, 1964 Sep 14, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



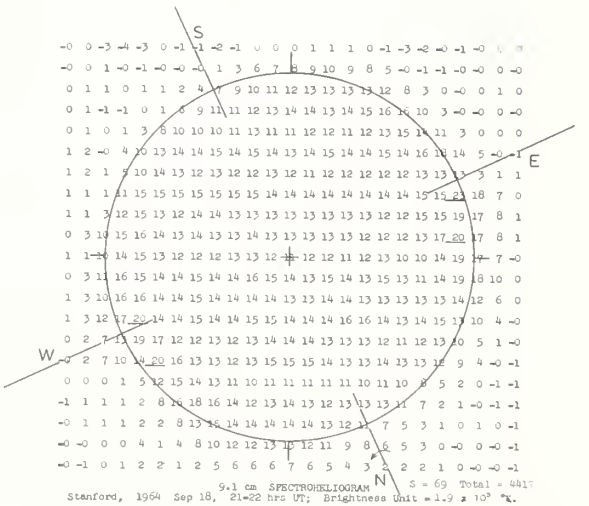
9.1 cm SPECTROHELIOGRAM S = 71 Total = 4615
Stanford, 1964 Sep 15, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 69 Total = 4238
Stanford, 1964 Sep 16, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 68 Total = 4381
Stanford, 1964 Sep 17, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



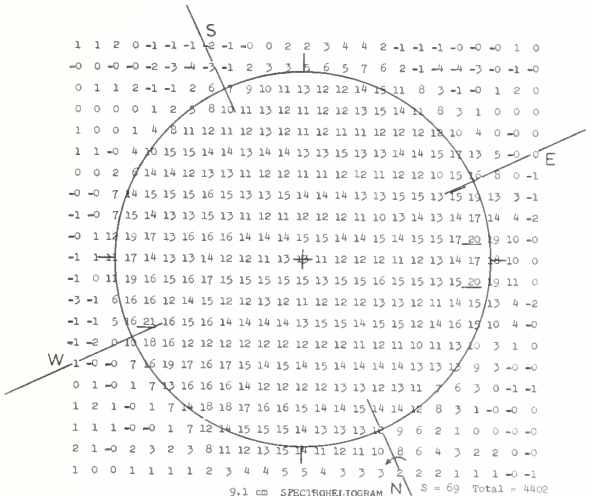
9.1 cm SPECTROHELIOGRAM S = 69 Total = 4417
Stanford, 1964 Sep 18, 21-22 hrs UT; Brightness Unit = 1.9 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

SEPTEMBER 1964

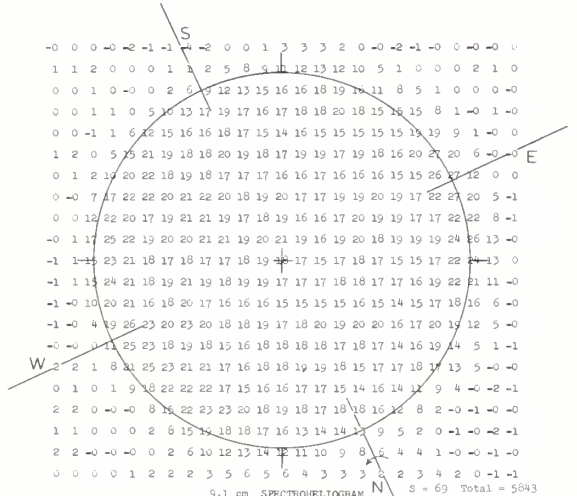
STANFORD

9.1 cm



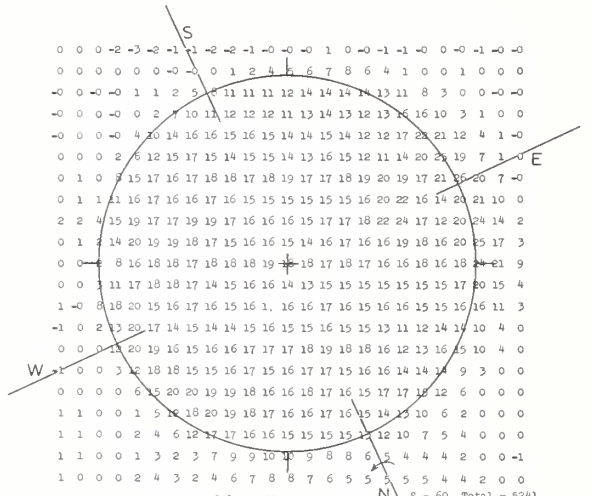
9.1 cm SPECTROHELIOGRAM S = 69 Total = 4402

Stanford, 1964 Sep 19, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



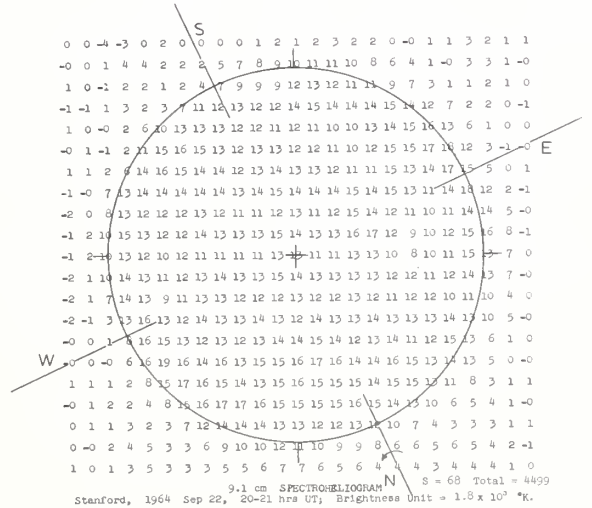
9.1 cm SPECTROHELIOGRAM S = 69 Total = 5843

Stanford, 1964 Sep 20, 20-21 hrs UT; Brightness Unit = 1.4 x 10^3 °K.



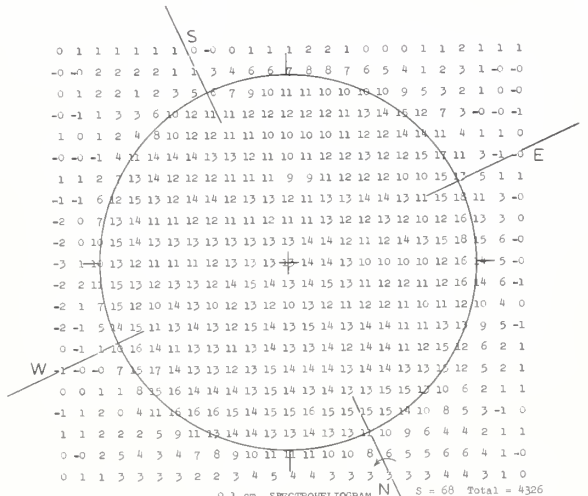
9.1 cm SPECTROHELIOGRAM S = 69 Total = 5241

Stanford, 1964 Sep 21, 20-21 hrs UT; Brightness Unit = 1.6 x 10^3 °K.



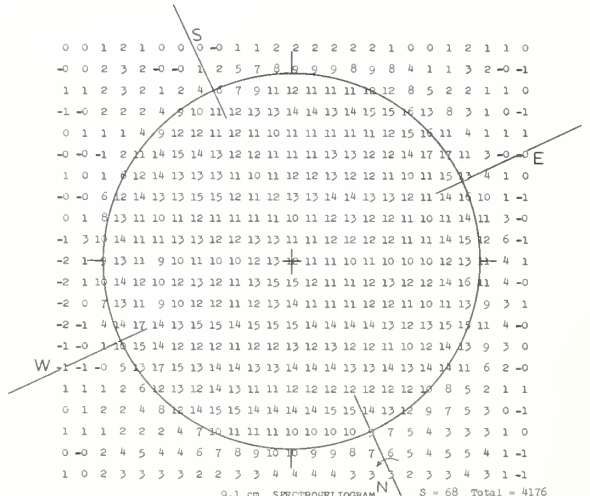
9.1 cm SPECTROHELIOGRAM S = 68 Total = 4499

Stanford, 1964 Sep 22, 20-21 hrs UT; Brightness Unit = 1.8 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 68 Total = 4326

Stanford, 1964 Sep 23, 20-21 hrs UT; Brightness Unit = 1.9 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 68 Total = 4176

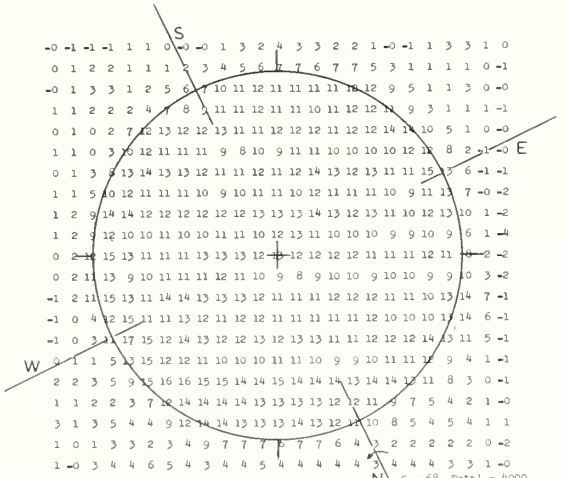
Stanford, 1964 Sep 24, 20-21 hrs UT; Brightness Unit = 2.0 x 10^3 °K.

SOLAR RADIO EMISSION SPECTROHELIOGRAMS

SEPTEMBER 1964

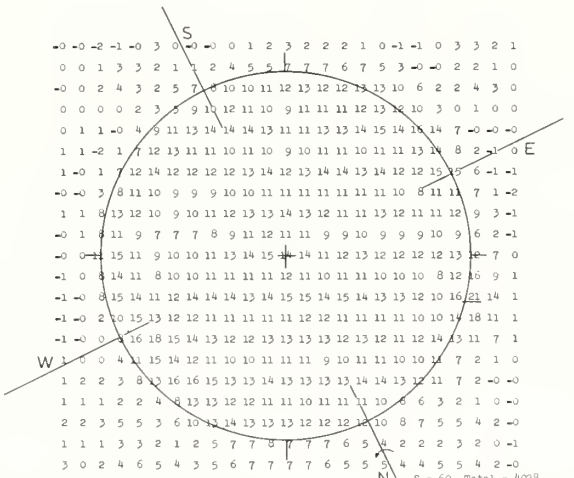
STANFORD

9.1 cm



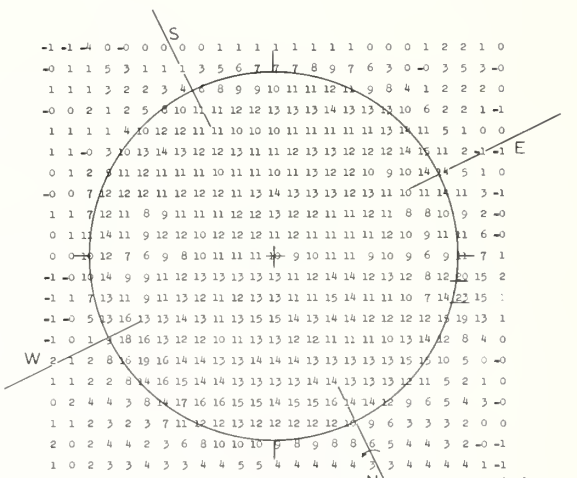
9.1 cm SPECTROHELIOGRAM S = 68 Total = 4000

Stanford, 1964 Sep 25, 20-21 hrs UT: Brightness Unit = 2.1 x 10^3 °K.



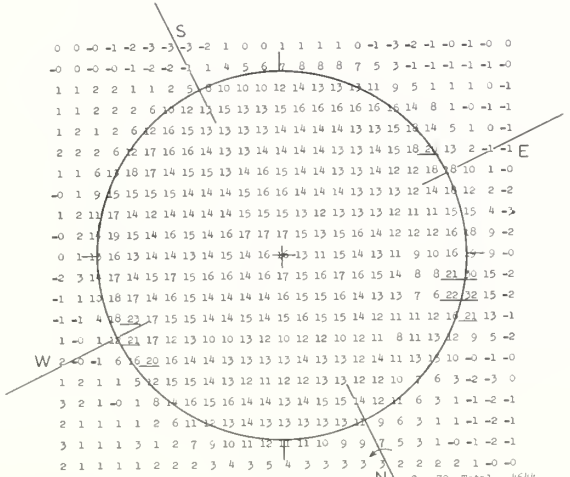
9.1 cm SPECTROHELIOGRAM S = 69 Total = 4028

Stanford, 1964 Sep 26, 20-21 hrs UT; Brightness Unit = 2.1 x 10^3 °K.



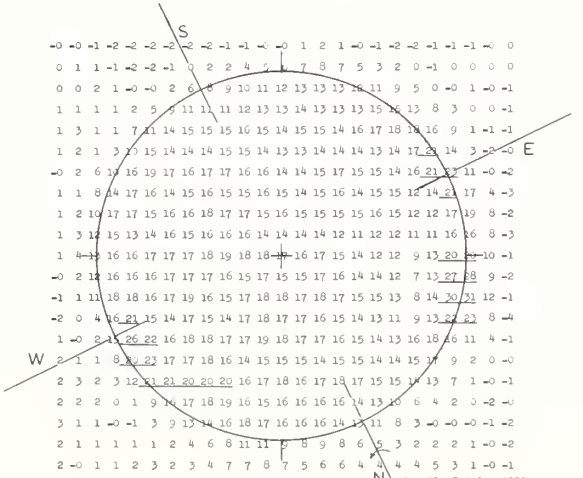
9.1 cm SPECTROHELIOGRAM S = 70 Total = 4176

Stanford, 1964 Sep 27, 20-21 hrs UT: Brightness Unit = 2.0 x 10^3 °K.



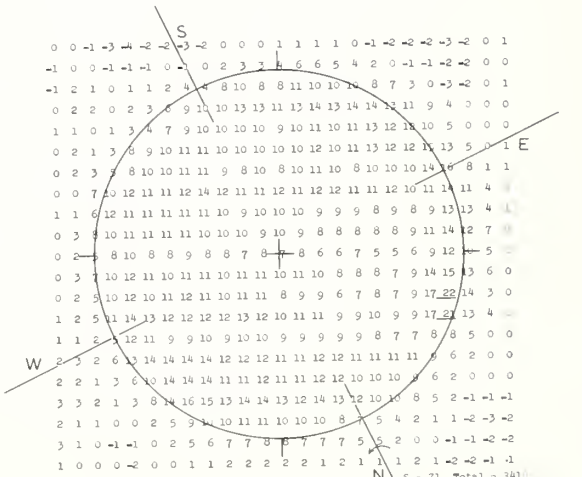
9.1 cm SPECTROHELIOGRAM S = 70 Total = 4644

Stanford, 1964 Sep 28, 20-21 hrs UT; Brightness Unit = 1.8 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 71 Total = 5111

Stanford, 1964 Sep 29, 20-21 hrs UT: Brightness Unit = 1.7 x 10^3 °K.



9.1 cm SPECTROHELIOGRAM S = 71 Total = 341

Stanford, 1964 Sep 30, 20-21 hrs UT; Brightness Unit = 2.5 x 10^3 °K

COSMIC RAY INDICES

(Climax Neutron Monitor)

IGC Station B 305

AUGUST 1964

Aug. 1964	DAILY AVERAGE COUNTS / HOUR*	Aug. 1964	DAILY AVERAGE COUNTS / HOUR*
1	3289.6	17	3278.7 ** 34
2	3283.1	18	3285.8 ** 14
3	3285.4	19	3299.0
4	3285.5	20	3298.4
5	3275.0	21	3319.9
6	3278.1	22	3318.4
7	3273.6	23	3315.0
8	3268.0	24	3314.2
9	3280.9	25	3301.9
10	3286.2	26	3314.5
11	3281.6	27	3318.4
12	3264.2	28	3308.5
13	3259.9	29	3313.4
14	3269.5	30	3310.8
15	3273.6	31	3319.8 ** 10
16	3275.2		

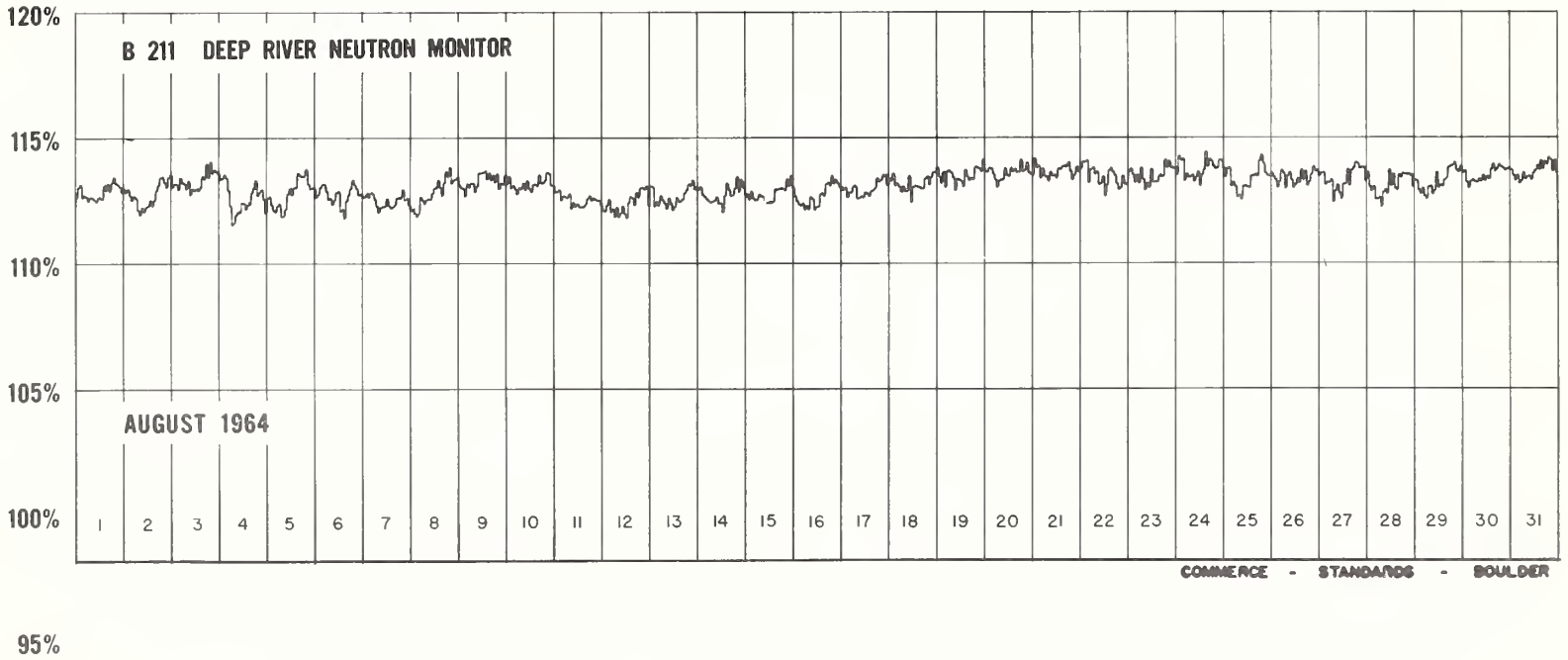
COMMERCE - STANDARDS - BOULDER

* Scaling Factor 128.

** No. of Section Hours Indicated with Asterisk If Sum of Both Sections is Less Than 40 Hours.

COSMIC RAY INDICES

(Pressure Corrected Hourly Totals)

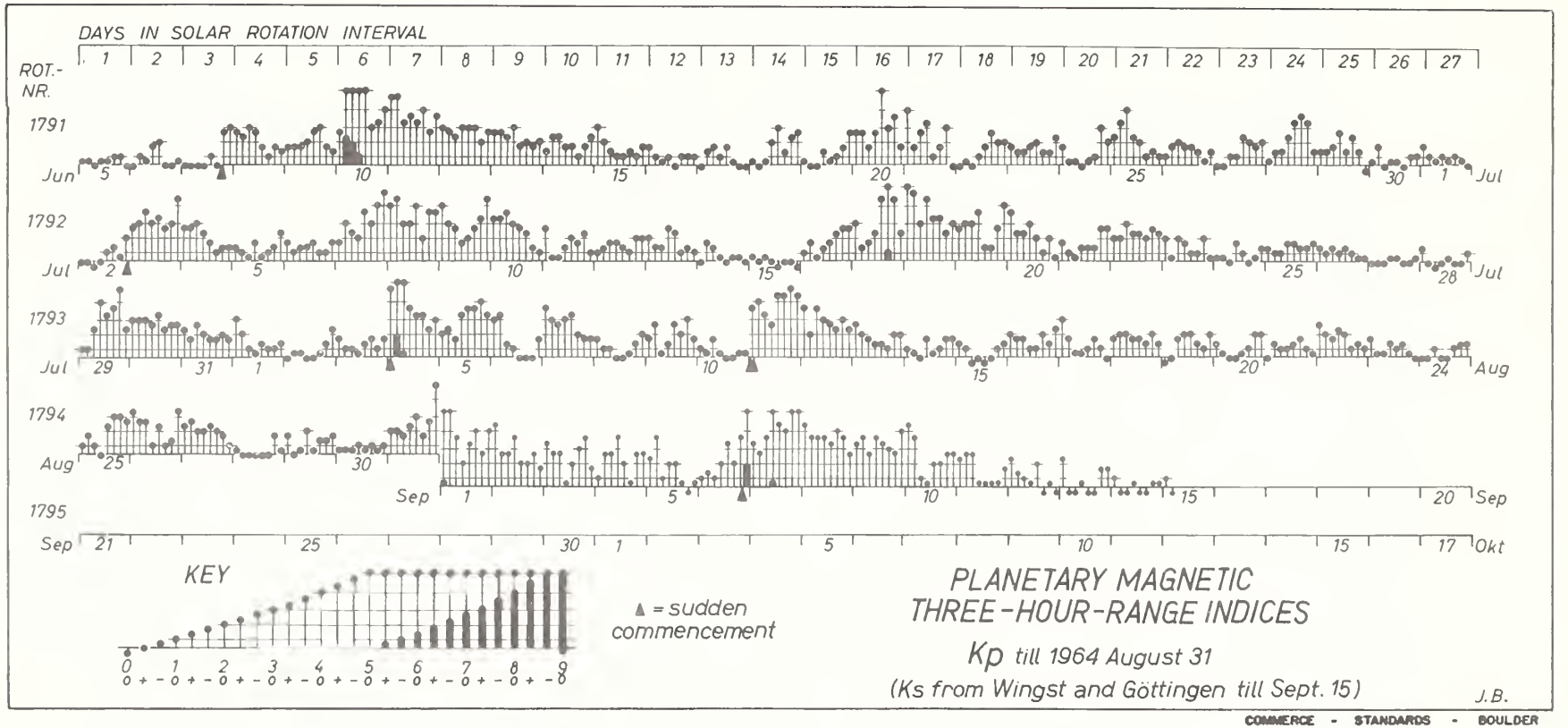


GEOMAGNETIC ACTIVITY INDICES

AUGUST 1964

Aug. 1964	C	Values Kp — Three hour Gr. interval 1 2 3 4	5 6 7 8	Sum	Ap	Final Selected Days
1	0.3	3o 2o 1o 1-	1+ 1o 1o 1+	11+	6	Five
2	0.2	0+ 1- 1- 0+	0+ 1- 1+ 2+	7-	4	Quiet
3	0.3	2- 1o 1o 1-	1+ 2- 1o 2-	10o	5	
4	1.3	5- 6+ 5+ 4-	3+ 3+ 2+ 3o	32o	34	10
5	1.0	2o 2+ 2- 3+	4- 4- 4o 3+	24o	16	15
						24
6	0.3	3o 3+ 1+ 1o	0+ 0+ 0+ 2-	11+	7	28
7	0.6	4- 3o 3- 3o	3+ 2o 2- 2-	21o	13	30
8	0.2	2- 1o 1o 0+	0+ 1- 1+ 2o	8+	4	
9	0.5	2- 3- 1- 1+	3- 2o 3o 2-	16-	8	
10	0.0	1o 1- 2- 1-	0+ 0+ 1- 1-	6o	3	
11	1.3	4- 4o 3+ 3-	4+ 4+ 5- 4+	31+	27	Five
12	0.8	4- 2o 4- 3o	3- 2+ 3o 2+	23-	14	Disturbed
13	0.4	3- 2o 2- 1+	1+ 1o 2o 2o	14o	7	
14	0.2	1o 1- 0+ 2-	1- 1o 2- 2-	9-	4	4
15	0.1	1+ 1o 0o 0+	0o 0+ 1o 1+	5+	3	5
						11
16	0.3	2o 2- 2- 1o	1o 2o 1+ 2+	13o	6	12
17	0.3	3o 2- 1- 1-	1o 2- 1o 0+	10o	5	31
18	0.3	2- 2o 2o 2-	2- 1+ 2o 1+	14-	6	
19	0.3	0o 0+ 2- 2o	2o 1+ 1o 2o	10+	5	
20	0.2	1+ 1- 0+ 0+	1- 1o 2o 2o	8+	4	
21	0.2	0+ 1+ 1o 1o	1+ 2- 1o 1-	8+	4	Ten
22	0.4	3- 2o 2- 2+	2o 1o 1+ 1o	14o	7	Quiet
23	0.2	2- 1- 1- 1+	1o 1+ 1- 0+	8-	4	
24	0.1	0+ 0+ 1o 0+	0+ 1o 1+ 1+	6o	3	2
25	0.6	1o 2- 1o 0+	2+ 3o 3o 3-	15o	8	8
						10
26	0.7	3+ 3- 3- 1o	2+ 1o 1+ 3+	18-	10	14
27	0.4	2+ 3- 2o 2o	2+ 2o 2- 1o	16o	8	15
28	0.1	1- 0+ 0+ 0+	0+ 0+ 2- 1-	5-	3	21
29	0.2	2- 0+ 1- 2o	1- 1+ 1+ 2-	10-	5	23
30	0.0	1- 1- 1- 1o	1- 1o 1- 1o	6+	3	24
31	0.8	2o 2o 2- 2+	3o 2- 3- 5-	20o	13	28
						30
Mean:	0.41			Mean:	8	

COMMERCE - STANDARDS - BOULDER


DAYS IN SOLAR ROTATION INTERVAL
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
ROT.-NR.
1791
Jun 5 10 15 20 25 30 1 Jul
1792
Jul 2 5 10 15 20 25 28 Jul
1793
Jul 29 31 1 5 10 15 20 24 Aug
1794
Aug 25 30 Sep 1 5 10 15 20 Sep
1795
Sep 21 25 30 1 5 10 15 17 Okt
KEY
0 1 2 3 4 5 6 7 8 9
0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0 + - 0
▲ = sudden commencement
PLANETARY MAGNETIC
THREE-HOUR-RANGE INDICES
Kp till 1964 August 31
(Ks from Wingst and Göttingen till Sept. 15)
J.B.
COMMERCE - STANDARDS - BOULDER

CRPL RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

AUGUST 1964

NORTH ATLANTIC

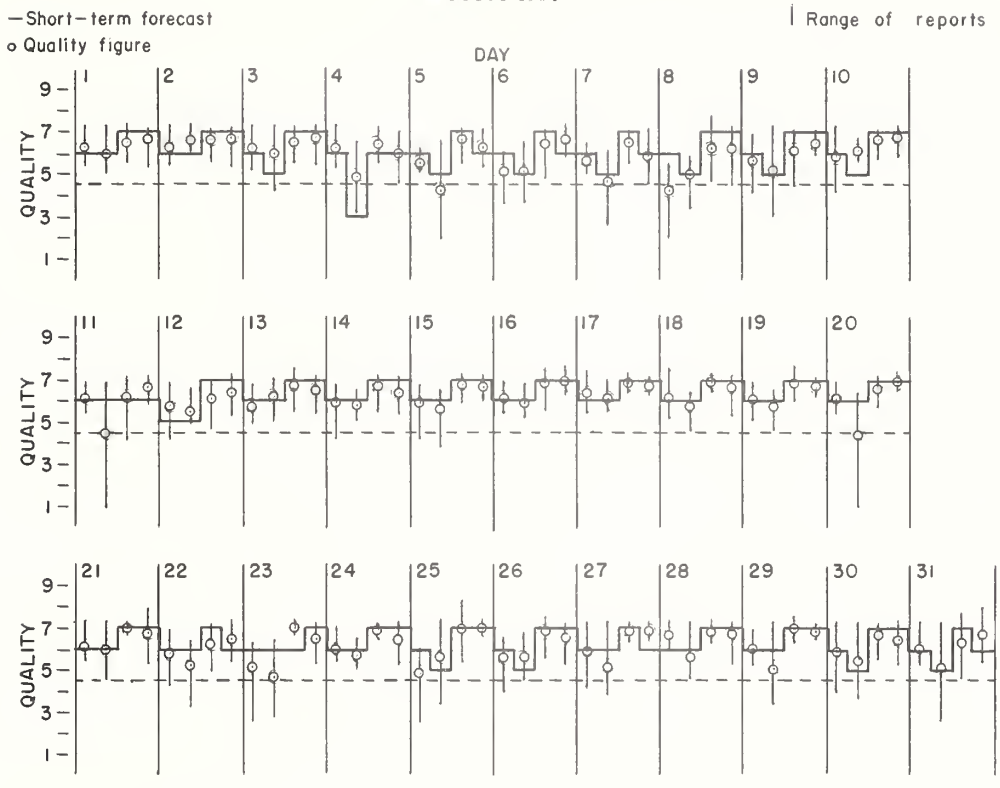
AUG 1964	NORTH ATLANTIC 6-HOURLY QUALITY FIGURES (00 TO 06 / 06 TO 12 / 12 TO 18 / 18 TO 24)	SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF: (00 / 06 / 12 / 18)	WHOLE DAY INDEX	ADVANCE FORECASTS (J-REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY: (1-7 DAYS FINAL J_S / 1-7 DAYS SDW J / 1-3 DAYS SDW J)	GEOMAGNETIC K_{FR} (HALF (1) / DAY (2))
01	6+ 6o 7- 7-	6 6 7 7	6+	6 6	2 1
02	6+ 7- 7- 7-	6 6 7 7	7-	6 6	1 1
03	6+ 6o 7- 7-	6 5 7 7	6+	5 5	2 1
04	6+ 5o 6+ 6o	6 3 6 6	6o	5 5	(5) 3
05	6- 4+ 7- 6+	6 5 7 6	6-	5 5	3 3
06	5+ 5+ 6+ 7-	6 5 7 6	6o	5 5	2 1
07	6- 5- 7- 6o	6 5 7 6	6-	6 6	3 2
08	4+ 5o 6+ 6+	6 5 7 7	6-	6 6	2 1
09	6- 5+ 6+ 7-	6 5 7 7	6o	6 6	2 2
10	6o 6+ 7- 7-	6 5 7 7	6+	7 7	2 0
11	6o 4+ 6+ 7-	6 6 6 6	6-	7 7	3 (4)
12	6- 6- 6o 6+	5 5 7 7	6o	7 7	3 3
13	6- 6+ 7- 7-	6 6 7 7	6+	6 6	2 2
14	6o 6- 7- 6+	6 6 7 7	6+	6 6	1 2
15	6o 6- 7- 7-	6 6 7 7	6+	6 6	1 1
16	6+ 6o 7o 7o	6 6 7 7	7-	6 6	2 2
17	6+ 6+ 7o 7-	6 6 7 7	7-	7 7	2 1
18	6+ 6- 7o 7-	6 6 7 7	6+	7 7	2 2
19	6o 6- 7o 7-	6 6 7 7	6+	7 7	2 2
20	6+ 4+ 7- 7o	6 6 7 7	6o	7 7	1 2
21	6+ 6o 7o 7-	6 6 7 7	7-	7 7	1 2
22	6o 5+ 6+ 7-	6 6 7 6	6o	7 7	3 2
23	5+ 5- 7o 7-	6 6 6 7	6-	7 7	2 1
24	6o 6- 7o 7-	6 6 7 7	6+	7 7	1 1
25	5o 6- 7o 7o	6 5 7 7	6+	6 6	1 3
26	6- 6- 7o 7-	6 5 7 7	6+	6 6	3 2
27	6o 5+ 7o 7o	6 6 7 6	6+	6 6	2 2
28	7- 6- 7o 7-	6 6 7 7	7-	7 7	1 1
29	6o 5o 7o 7o	6 6 7 7	6+	7 7	1 2
30	6o 6- 7- 7-	6 5 7 7	6+	6 6	1 1
31	6+ 5+ 6+ 7-	6 5 7 6	6+	5 5	2 3
Score: Quiet Periods P		25 16 24 23		14 14	
S		5 11 7 8		17 17	
U		0 1 0 0		0 0	
F		0 0 0 0		0 0	
Disturbed Periods: P		0 0 0 0		0 0	
S		0 1 0 0		0 0	
U		0 0 0 0		0 0	
F		1 2 0 0		0 0	

NORTH PACIFIC

NORTH PACIFIC 8-HOURLY QUALITY FIGURES (03 TO 11 / 11 TO 19 / 19 TO 03)	SHORT-TERM FORECASTS ISSUED AT (02 / 09 / 18)	WHOLE DAY INDEX	ADVANCE FORECASTS (J_P REPORTS) FOR WHOLE DAY, ISSUED IN ADVANCE BY: (1-7 DAYS FINAL J_{PS} / 1-7 DAYS SDW J_P / 1-3 DAYS SDW J_P)	GEOMAGNETIC K_{SI} (HALF (1) / DAY (2))
6 6 7	7 7 6	6	6 6	2 0
6 6 6	7 7 7	6	6 6	0 1
6 6 7	7 7 7	6	6 6	1 1
4 3 6	7 4 6	(4)	6 6	(5) 3
5 4 6	6 6 6	5	6 6	2 3
5 5 5	6 5 6	5	6 6	2 0
6 4 6	6 6 6	5	6 6	3 2
5 5 7	6 6 6	5	6 6	1 0
6 5 6	6 6 6	5	7 7	1 2
6 5 6	6 6 7	6	7 7	2 0
6 6 6	6 4 6	6	7 7	3 3
5 5 6	5 5 6	5	7 7	(4) 2
5 5 6	6 6 6	5	5 5	2 1
6 6 6	6 6 6	6	5 5	1 1
6 6 7	6 6 6	6	6 6	1 0
6 5 6	6 6 6	6	6 6	1 1
6 5 7	6 6 6	6	6 6	1 1
6 5 7	7 6 7	6	6 6	2 1
6 5 6	7 6 7	6	7 7	1 1
6 6 7	7 6 7	6	7 7	1 0
7 6 7	6 7 7	6	6 6	1 1
6 6 7	7 7 7	7	6 6	2 1
6 6 7	7 7 6	6	6 6	1 1
6 6 7	7 6 7	6	6 6	0 1
6 5 7	7 7 7	6	6 6	0 2
6 6 7	7 6 6	6	6 6	2 1
6 6 7	7 7 7	6	7 7	2 2
7 5 7	7 6 7	6	7 7	0 0
6 6 6	7 6 7	6	7 7	1 0
6 6 8	6 6 7	6	6 6	1 0
6 5 6	6 5 6	5	4 4	2 3
	12 10 19		15	
	18 16 12		13	
	0 1 0		2	
	0 1 0		0	
	0 0 0		0	
	0 1 0		0	
	0 0 0		0	
	1 2 0		1	

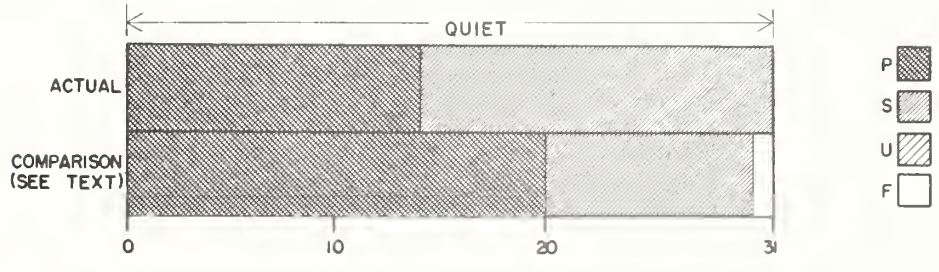
NORTH ATLANTIC

AUGUST 1964

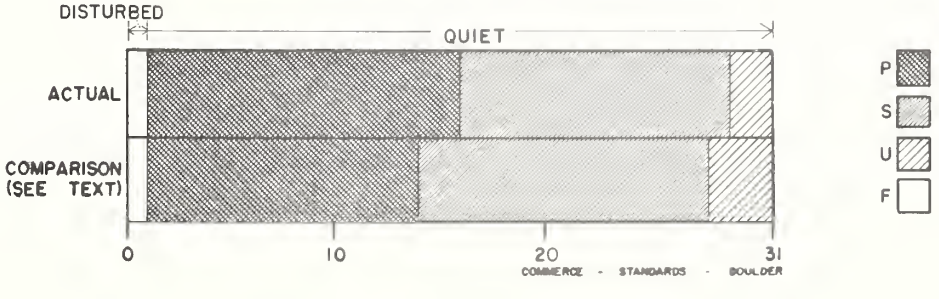


OUTCOME OF ADVANCE FORECASTS--FINAL ESTIMATES (1 TO 7 DAYS AHEAD)

NORTH ATLANTIC

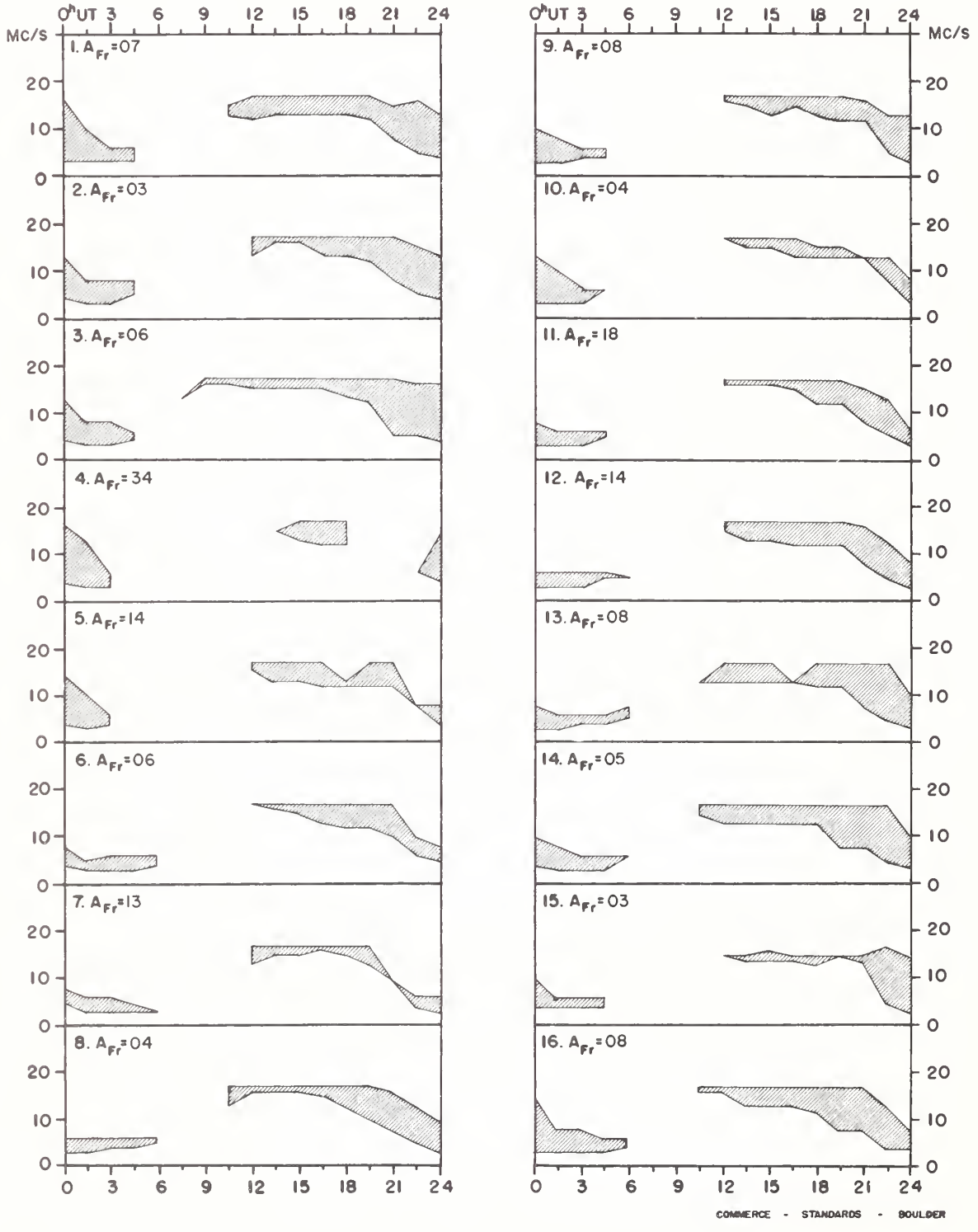


NORTH PACIFIC

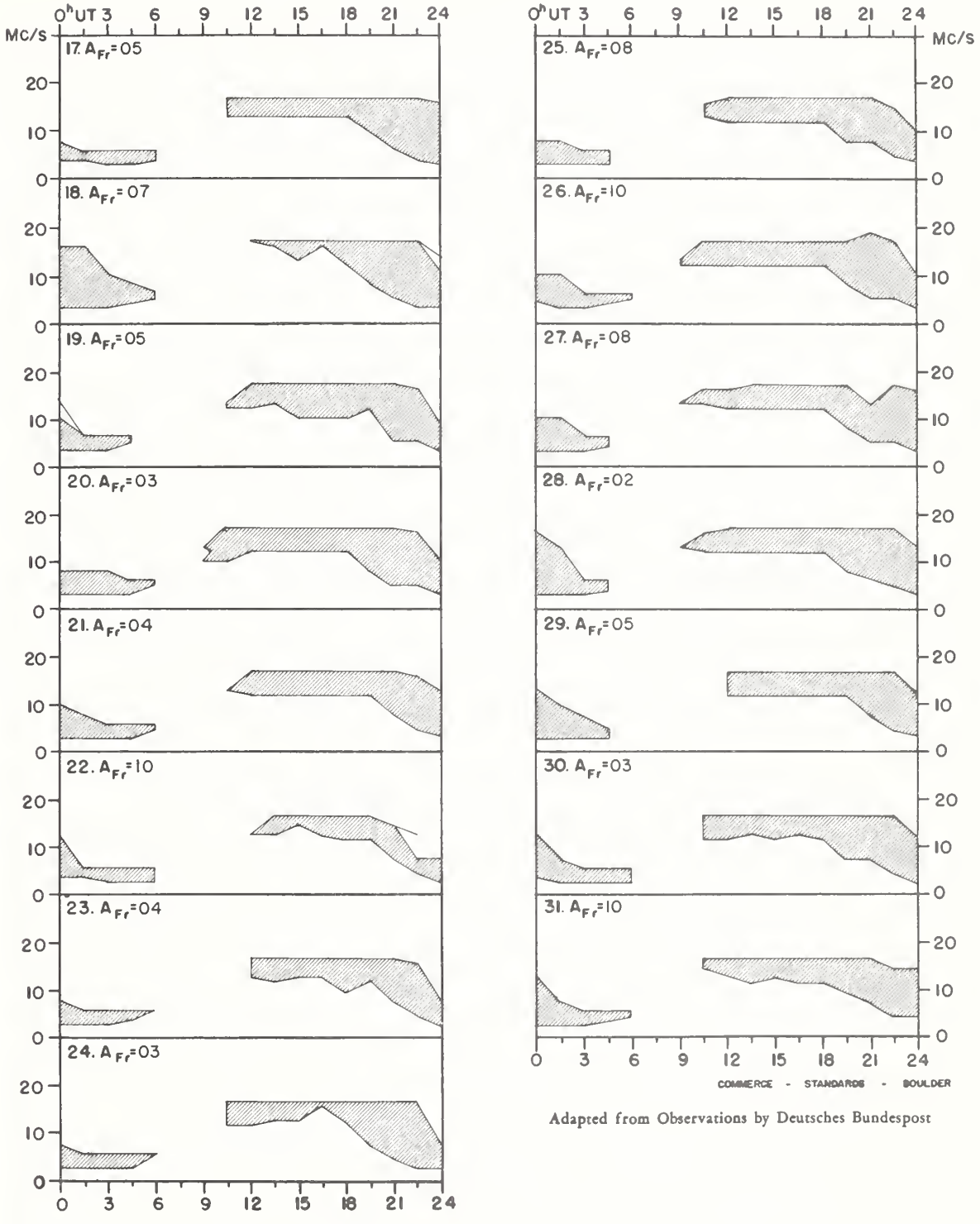


USEFUL FREQUENCY RANGES -- NORTH ATLANTIC PATH

AUGUST 1964



AUGUST 1964



Adapted from Observations by Deutsches Bundespost

IQSY ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

SEPTEMBER 1964

SEPT. 1964	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT			
			NO.	TYPE	TIMING	ELABORATION
3	0400		100	Solar Activity	Exists	East Limb
13	0400		101	Magnetic Calm	Exists	
14	0400		102	Magnetic Calm	Exists	
18	0400		103	Solar Calm Stratospheric Warming	Exists Exists	Over McMurdo Sound region Movement unknown
19	0400		104	Solar Calm Stratospheric Warming	Exists Exists	McMurdo Sound Eastward movement suspected
20	0400		105	Solar Calm Stratospheric Warming	Exists Exists	Ross Sea region Eastward movement suspected
21	0400		106	Solar Calm	Exists Exists	Ross Sea Eastward movement suspected
22	0400		107	Magnetic Storm Stratospheric Warming	22/0245Z Exists	Over Ross Ice Shelf Southeastward movement suspected
23	0400		108	Stratospheric Warming	Exists	Over Ross Ice Shelf weakening
24	0400		109	Stratospheric Warming	Exists	Over McMurdo Vostok region weakening
25	0400		110	Stratospheric Warming	Exists	Over Vostok region Westward movement suspected
26	0400		111	Stratospheric Warming	Exists	Over Amundsen-Scott Vostok region Southwestward movement suspected
27	0400		112	Stratospheric Warming	Exists	Over South Pole region
28	0400		113	Stratospheric Warming	Exists	Near South Pole region
29	0400		114	Stratospheric Warming	Exists	Near South Pole region
30	0400		115	Stratospheric Warming	Exists	Near South Pole spreading to West Antarctica